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FEBRUARY 1949

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**ANNUAL
CATALOGUE
ISSUE**

BUYER'S GUIDE PAGES 49-50

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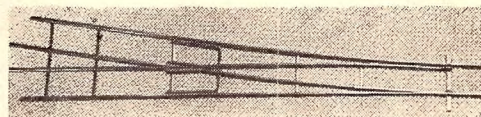
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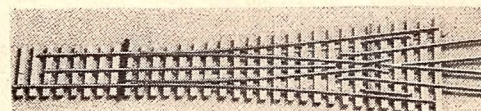
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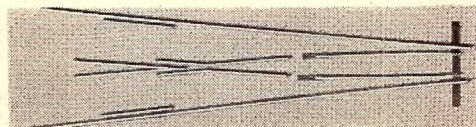
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Three Rail Switch



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O GAUGE SCALE

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No. 010 The Yard Switch—Only 13" long, on a 48" radius. If you're cramped for switching space, this is the boy \$3.50

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Around the Clubs

UTICA, N. Y. The Mohawk Valley Railroad Club is once again on the map. They are now located at new quarters, 411 Broadway, and the survey gang has done a fine job of putting the new roadway on paper to the unanimous approval of the crew. The use of open bench type construction designed for easy removal in their last location has proven a boon to the track crews. A minimum amount of time was used in erecting the tables, stringers and finally the roadbed which is $\frac{3}{8}$ " pine with $\frac{1}{4}$ " paper board added to deaden the noise.

The area available to the club is 50' x 40'. Operation will be point to point, single track with passing sidings long enough to give the illusion of double track on the outside perimeter of the room. By using a 3-track lead, a sizable railroad will result. A large city built six inches above the 42" average track level and running on a diagonal of the room will give visitors a worm's-eye view of the superb equipment of the Susquehanna Southern Traction Co. which enjoys a franchise in the city as well as interurban trackage rights north and south from the city line with freight interchange with the Mohawk Valley R. R. Co. Working under the able eye of Pres. Lawrence Polixie, Track Supt. (and the only regular railroad man on the roster), the track crew is making rapid progress and a complete loop can be looked for in the near future. Plans for repainting and classification of rolling stock are moving forward and news of new equipment of both railroad and traction companies will be forwarded soon. Club nights are Wednesdays at 8 and any and all interested rails will be welcomed.

DANVERS, MASS. The 1949 schedule of the New England Live Steamers has now been prepared and meets will be held on the following dates: May 1, June 5, July 3, Aug. 7, Sept. 4 and 30. The 17th Annual Brotherhood Meet will be held October 1 and 2. Anyone interested in live steam is invited to attend these meets; for further information contact Les Friend, 90 High Street, Danvers.

BALTIMORE, MD. To arouse new interest, the Baltimore Society of Model Engineers are staging a model building contest, awards to be made April 22. Prizes will be awarded to the following classes: Locomotives; cars, both passenger and freight; scenery; and wayside structures. The first prize winner will receive a plaque on which his name will be permanently inscribed and to be held by him for one year.

CANAL ZONE, PANAMA. In May of last year, nearly 100 years later than
(Continued on page 37)

O-GAGE scale model locomotives, cars, parts—a complete line for the model builder.

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703 Childs Street Wheaton, Ill.

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**X-actly
what your
work bench
needs**

Look at this list:

#1D Pin Vise	\$.75
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#41 Sander	.35
#45 Spokeshave	.45
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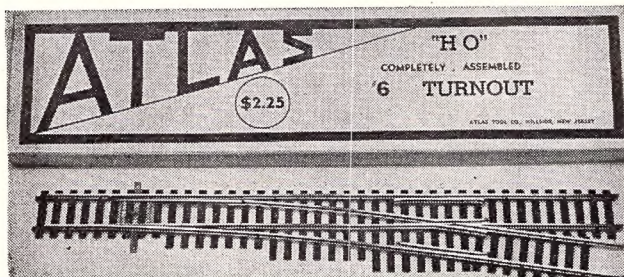
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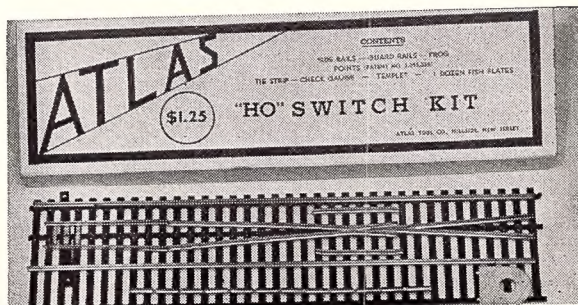
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COMPLETELY ASSEMBLED HO TURNOUT

All parts are neatly soldered. Tie strip is extra thick, with holes pierced for extra spiking. Points are made of solid construction (Patent No. 2,295,358). Staples are put through ties to resemble spikes in all places necessary to hold turnout to N. M. R. A. specifications.

Wye	\$2.25
No. 4, left-hand or right-hand	2.25
No. 6, left-hand or right-hand	2.25
No. 8, left-hand or right-hand	2.50



THE ATLAS HO SWITCH KIT

The economically minded modeler will find this kit containing more value in it than any switch on the market today. There are no extras to buy. Besides the stock rails, guard rail, frog and points, you get the switch tie strip, check gauge, one dozen rail joiners and a full scale template with complete instructions for laying switch, L.H. or R.H.

Wye No. 4 and 6 switch kits	\$1.25
No. 8 switch kits	1.50

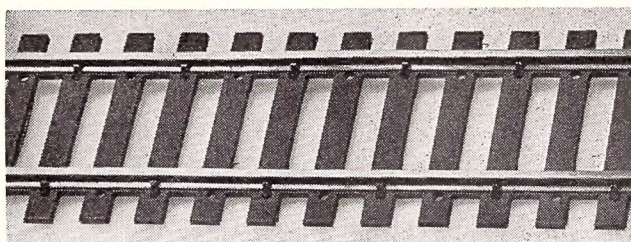
There's a "JOE" in every home or club layout. He thinks, speaks, eats and sleeps model railroads. Ask him, ten to one he will say, "ATLAS."



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**SEE YOUR
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HO Straight Track,
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HILLSIDE, N. J.

THE MODEL CRAFTSMAN

Vol. 17, No. 9

February, 1949

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FRONT COVER

An American Type loco pounding the rails of Sherman Dance's (Teaneck, New Jersey) HO layout. Turn to page 8 for a construction article on this popular 4-4-0. Photo by John Capko

DON'T BE A DUMMY!



Why Use DUMMY TRUCKS on Your HO ROLLING STOCK

when you can use Silver Streak's "Guaranteed Perfect" Sprung and Equalized Trucks for the same price . . . just \$1.10 PER PAIR!

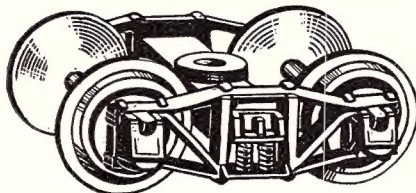
Sprung and Equalized Trucks minimize those annoying derailments that take the pleasure out of HO operation. More realistic in appearance, too!

Silver Streak trucks are scaled down from the original prototype blueprints, and their flexibility makes them operate like prototype trucks!

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A freight truck for every purpose. Here's the newest addition to the Silver Streak line of trucks . . .

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SAFETY VALVE

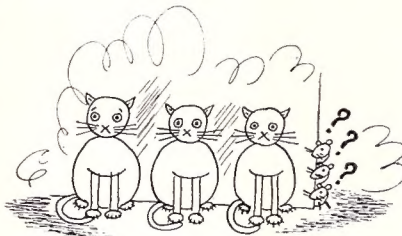


WAIT A SCINUTE

Mr. W. A. Pogue, whose letter appears in your December Safety Valve knows his stuff on operation by time table and train order. But like some other model railroaders, he uses "scale time." If modelers go to such lengths for realism, it is high time that someone pointed out to them that the "scale time" idea is a pure fallacy.

Remember the old riddle, "if three cats catch three rats in three minutes, how many cats can catch nine rats in nine minutes?" The answer: the same three cats.

Similarly, if it takes a real train a real minute to go a real mile, how long does it take a miniature train to go a miniature mile? It takes a *real* minute—not a miniature minute (or "scinute," as somebody has called it). Of course it might be argued that since Mr. Pogue's railroad is only 1.84 miles long, a train could get over the road before the dispatcher could get the engine number and the names of the conductor and engineer written down on his train sheet.



But there's a real railroad that's only 1.03 miles long. And it would be a simple matter to put in a few spurs along the line and give the freight train some setouts and pickups to make, while the passenger train could make a couple of five minute station stops to handle mail, express and baggage.

If a miniature railroad is built on platforms so arranged that one can walk along the track, the engineer and conductor can actually go "out on the road" with the train. Rheostats mounted at intervals along the platform can control the track sections. The engineer can run the engine, and the conductor can throw the switches, make couplings and handle the waybills. (If you have orders and clearances, why not waybills?)

The easiest way to run a one-man railroad by the book is to issue a work order, something like this: "Engine 1 works extra from eight one (8:01) p.m.

until eleven one (11:01) p.m. between Grandopolis and Bumping Post not protecting against extra trains." Then the Modeler can switch cars all evening without worrying about any more orders.

But for pete's sake, forget this outlandish "scale time." There just ain't no such animal . . . W. H. Higginbotham, Hoboken, N. J.

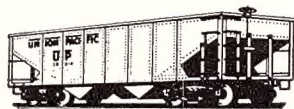


FAULTY TRAIN ORDERS

Having been a steady reader of your magazine for the past seven years I don't have to tell you how good your mag is. But I didn't write to criticize your publication, but rather to question a letter that you published in the December Safety Valve written by Wm. Pogue, of Indianapolis.

Judging from his letter, I formed the opinion that he thinks all model railroaders, HOers in particular, don't know the first thing about running a railroad. He states, "Suppose you run over the road." Then he goes on to say "Yes, the HOer that was here couldn't fathom the train order and by the time . . ." Mr. Pogue, you made a broad statement when you said, "Suppose you . . ." You seem to forget that this publication is read by many thousands of people all over these United States and many of them might know just a little more about running a railroad than you think. Haven't you ever heard of the Centinela Valley Model Railroad of Hawthorne, Calif.? They've been operating by train orders for quite a long time.

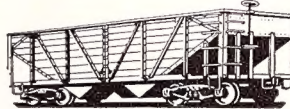
Excuse me for this long drawn out discussion about train orders, but train orders touch a soft spot in me and I like to talk about them. I have quite a collection of Western Pacific train-orders and am quite familiar with the Standard Book of Rules and I just couldn't help knocking other fellows in his hobby because they don't operate their railroads the way he thinks they should. . . . Ray Przybos, Hayward, Calif.



STRAIGHT SIDE



PANEL SIDE



COMPOSITE SIDE

HOPPER CARS

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10. Nickel Plate	1.75

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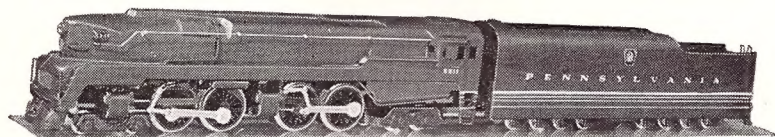
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4. Ends pair	.30
5. Steel Roof Section	.30

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WHAT MODEL BUILDERS SAY



Leigh K. Selfridge, 138 Earl Lane, Hatboro, Pa., states . . . "I built your model of the PENNSYLVANIA T-1 Locomotive in the Model Railroad Roundhouse Workshop at the recent World Hobbies Exposition in Philadelphia. This model was entered in a contest at the end of the show and I was awarded the first prize in the Locomotive division."

"The wealth of detail on the boiler casting and the very fine tender combined with the simplicity of construction make this the truly outstanding HO gauge locomotive of today."

The sensational PENNSYLVANIA T-1 and Reading CRUSADER were enthusiastically viewed by the nation's foremost model railfans at the recent World Hobby Exposition.

These model builders marvelled at the sturdy construction, the super-detailing, the "big engine" power and the simplified instructions for accurate assembly. Read what two of the "top" builders have to say about these fine locomotive kits. They liked the outstanding features — you will, too!

Write for illustrated literature

The PENN LINE

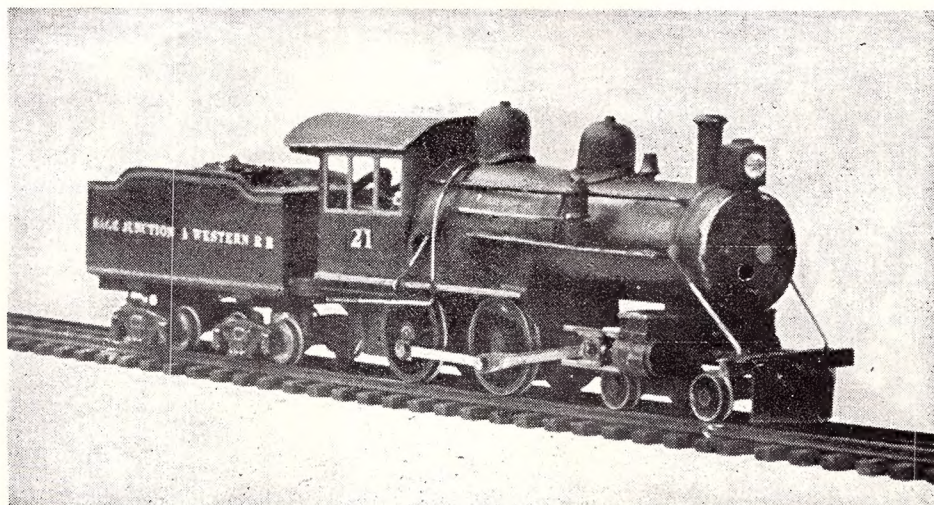
PENNSYLVANIA T-1	\$49.50
with two motors	\$59.50

41 N. Reading Avenue -- Boyertown, Pa.



Herb E. Lynch, Sr., president of the North Penn Model RR Association of Phila., Pa. reports after constructing the Reading CRUSADER model . . . "The design and workmanship are the best I have ever found in any kit I have assembled. Let me say to all model builders that every part of this kit FITS without a lot of FUSSING around."

Reading CRUSADER priced only \$44.50



Building an American Locomotive

By SHERMAN E. DANCE

THE 4-4-0 or American Type Locomotive was a favorite at the turn of the century and had enjoyed great popularity for a score or more years before. Today their use on American railroads is indeed a rare sight. Despite their age, a few are still in use on small roads scattered over our nation but much of their service is now in pulling only a car or two in branch line service or at the head end of a work train. At one time they were the speedy little engines that pulled three or four wooden, open-end coaches across our country—their exhaust a distinct and quick, shrill puff.

On the model railroad layout they too serve in the branch line service and work trains. For a bit more color, why not have her pull a few cars on the local freight? For the brass hat that operates but a single track over all types of terrain, the 4-4-0 is just the locomotive. It doesn't require the great and extensive layouts of mainline, streamliners, big cities, etc., just open country—the far west perhaps with mountains, trees and trestles—real color in both scenery and locomotive.

This trim little loco is easy to build—one on which the beginner will gain the necessary experience and also give the inspiration for larger types as the layout grows. About 99% of this locomotive is constructed out of brass and lends itself for easy modeling and, if a beginner, for easy soldering. Let's begin with the framework of the loco—the chassis—which is shown in two views, **Detail A**.

For a model in HO, the chassis is made from $\frac{3}{8}$ " by $\frac{1}{2}$ " channel brass ($\frac{1}{16}$ " walls) and less than 5" in length. At the pilot end, a portion of the side wall is removed to allow for the swing of the

pilot trucks and, as in the prototype, to give it that "open" appearance to the front end. The side walls are grooved in two places to receive the driving axles. You will note that only "centers" have been dimensioned and not the groove. The width of the groove is determined by the width of the driving axles. The grooves should be snug fits, yet loose enough to allow free turning of the axles. The use of a fine tooth hack saw blade will do this job nicely. Of course, it is expected that you scribe guide lines carefully and squarely and that cutting is done on the *inside* of the scribed lines. A fine file will dress them to proper size and also give that snug fit.

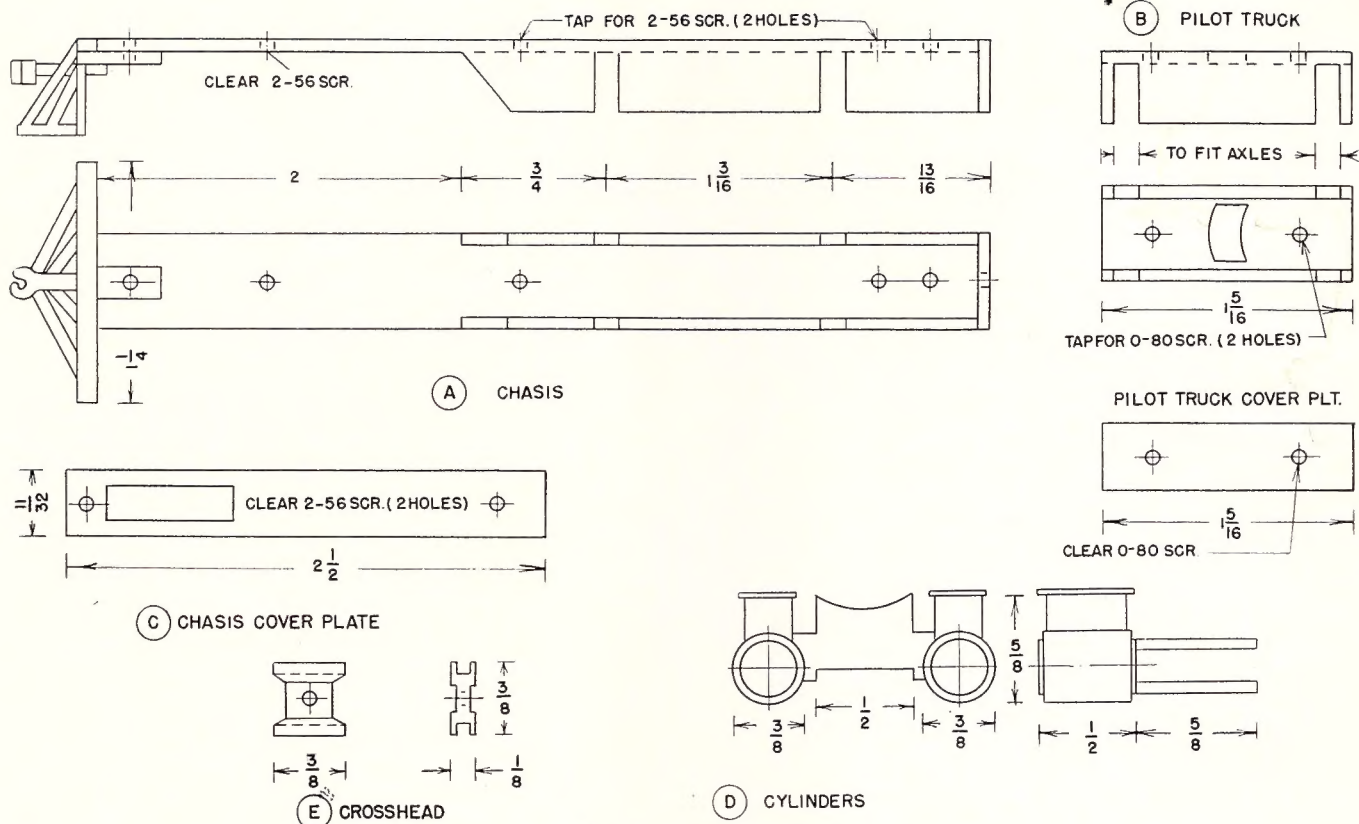
The chassis of the locomotive is such that one cannot over emphasize the importance of close fitting and careful workmanship. On the driver end of the chassis there are two tapped holes to receive 2-56 machine screws. The right un-tapped hole serves as one mount for the Pittman DC 60 motor while the remaining two tapped holes will receive the screws from the Chassis Cover Plate (Detail C). To the left or *head* end you will note that the chassis is also tapped but not dimensioned. This tapped hole may be of your choice in size and location—its purpose only to attach the cast pilot (which in this case was a Mantua) into which a cast coupler has also been secured. Thus the main chassis is completed, except for the cover plate.

The Cover Plate (Detail C) is very simple. From a piece of $\frac{1}{16}$ " steel (or brass), cut a piece $1\frac{1}{32}$ " x $2\frac{1}{2}$ ". Two holes are drilled to clear the 2-56 attaching machine screws. The holes are to line up with the corresponding tapped holes of the main frame. One end of the Cover

Plate has been cut out to clear the driving gear of the driving or powered axle. The size of your gear will determine the size of this opening.

Drop the driving wheels into the grooves of the chassis and attach the Cover Plate with flat head 2-56 machine screws. If drawn up tight (as they should), the drivers will not turn so it becomes necessary to put in two small wood blocks (one at each end) just very slightly greater than the diameter of the driver axles. These may be wood but cut pieces of brass (or even a nail cut to fit) soldered onto the cover plate will justify the *squeeze* on the drivers and allow them to turn freely. The blocks are not shown in the illustration but can be placed conveniently near the drivers to avoid the squeeze. Drivers on this locomotive are 21 mm which were obtained from Mantua, already mounted and quartered. It is recommended that mounted and quartered drivers be purchased despite the fact that some have done it themselves. This saves a lot of time and without the proper equipment, a lot of hard work. Thus the main chassis and cover plate are completed, now for the pilot truck.

Very good pilot trucks (4-wheel) may be purchased from Mantua at low prices. However, if you want to build your own for added weight, and also to have as much as possible homemade, I refer you to the drawing, Detail B. Two views of the Pilot Truck are shown together with the Pilot Cover Plate. This truck, like the main chassis, is cut from the same size channel and grooved to receive the pilot truck wheel sets. Wheel sets are the usual freight car wheels and axles. The extended part of the axle (that nor-



Plans full size for HO Gauge

mally goes into the journal) was filed off since the pilot truck has only an inside frame. The channel brass is cut to $1\frac{1}{16}$ " long and, like the locomotive frame, it, too, is grooved to receive the truck axles. The outer edges of the grooves are $\frac{1}{8}$ " from the ends of the truck. You will note that the truck is drilled and tapped—dimensions are unimportant as long as the tapped holes clear the axles. My model was drilled and tapped for 0-80 machine screws, but there is no reason why larger sizes could not also be employed.

The lower illustration of the Detail Drawing indicates that the truck has a small, curved, open slot. The truck mounting screw passes through this slot wherein the slot allows the lateral movement of the truck—a necessary action on curves. The slot is not dimensioned but it has a 1" radius and is wide enough to freely pass the size mounting screw you employ.

The Pilot Cover Plate is likewise cut to size and drilled to clear whatever size screw is used and to line up, of course, with the tapped holes of the channel. As was done on the main loco frame, it is again necessary to use hard wood "blocks" or brass to ease the squeeze on the axle when the whole is assembled. On my model, I cut a piece of linotype slug (printers will give you a slug) to completely fill the open gaps of the channel (allowing room for the mounting screws) in place of the usual blocks. The added weight of the linotype (lead) gives the desirable weight to the truck. It is necessary to use a small expanding coil spring between this truck and the main frame

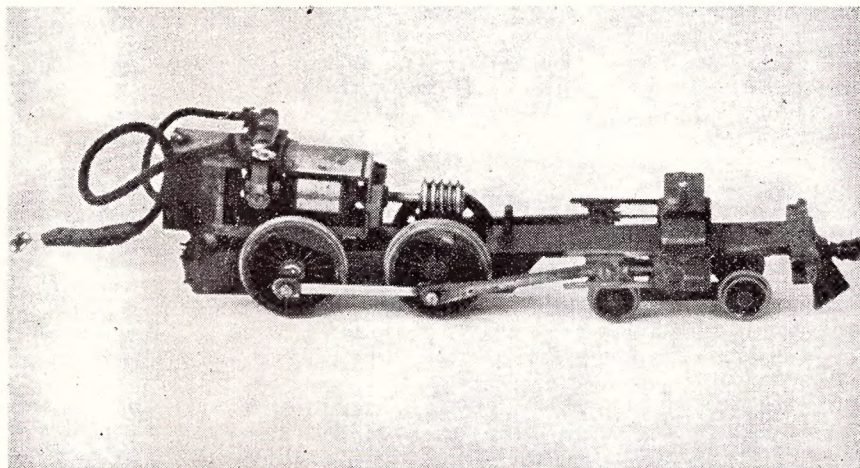
so that sufficient effort is exerted on the truck to have it "hold the rails." These pilot truck springs, as they are called, are obtained from most model shops for about five cents.

Because the pilot truck is all metal, we must necessarily insulate the wheels from the frame. Naturally, the wheels are already insulated at the axles on but one side. The insulated wheels must be both placed on the same side of the truck. However, if the inside of the wheels should rub against the truck frame (and it surely would), it would short out on the frame. This is easily overcome by cutting a few small pieces of post card stock and cementing them on the truck frame between the wheels and the frame. It is only necessary to do it to the two wheels on the insulated side, but doing

it on all four will lessen the lateral movement of the wheel sets.

The cylinder assembly is perhaps the most troublesome of the entire locomotive to build. I would suggest that the beginner buy this item. I know of no place where the *exact* type of cylinder and steam chest is obtainable and large enough for this locomotive. The type as used on the Mantua Roundhouse Goat would fill the bill completely if it were possible to swell her up a bit—but it is too small for this larger locomotive. However, a more modern cylinder assembly (with crosshead guides included) can be purchased from George D. Stock, and although not the shape for the prototype of this loco, Stock's Switcher Cylinder can readily be used.

(Continued on page 33)





GETTING STARTED

PART VI

By JOHN R. BARKLEY

MANY of you no doubt have some kind of layout with ingenious arrangement of tracks and good operation. Perhaps you have utilized all the space properly available for those tracks and if you are not engaged in building additional rolling stock, have enough "spare" time on hand to undertake something new. All right, here we go. How would you like to make that layout look more "railroady"? Scenery is what it takes and, for the purpose of this article, we will call anything that is superfluous to actual running of trains around the layout scenery. This will include trackside structures such as coaling towers, industrial buildings, signal towers, culverts, etc. We will take for granted that bridges are necessary for crossing another lower track or other obstacle and if the crossing is being made temporarily by a baseboard supported at each end, it can easily be made to look like a reasonable facsimile of a girder bridge by the addition of the side girders, some ties, bridge abutments and painted to resemble concrete. The girders may be painted a very light silvery grey or flat black. Road name decals or the name painted on carefully adds to the appearance.

Now for other structures. First decide just what structures you will want by determining the industries to be represented. Then figure out logical locations for the different buildings. When laying out residential sections, be very careful and do not overdo this. Unless you have an exceptionally large layout you had better stay away from any kind of town. A farmhouse here and there will look much better than a town crowded into an unlikely place. The same thought applies to an industrial section. However, a warehouse, grain

elevator or coal yard may set all by itself, served by a siding, and not look out of place.

Now, having a more or less rough idea as to what we are going to put where, we can start in with the groundwork. This is assuming the layout is of the open grid or framework type. Those of you with the solid table top layout already have a base. So on the open type layout, we will have to nail flat boards in place for the various structures. Any roads planned for will also have to have a foundation. When this is done we can set the buildings loosely in place and start in on the framework for more rolling country. Even though you may not want any hills or vales on your pike, do not figure on all of it being perfectly level. Very seldom is such a phenomenon encountered in nature and even our Western deserts seem to have some rise and fall, however gradual, and railroads have to fill a little here and cut a little there trying to attain, but never reaching, a perfectly level roadbed. Keep the track level if you wish but let the terrain roll a little. Here again it is easy to overdo, especially in the placing of a hill big enough for a tunnel which almost everyone seems to want. On a small layout it is better to have a small, natural appearing hill with a cut through it for the track than one just big enough for the tunnel. On small layouts confine your tunnels to a back corner of the layout where it appears that you can see but a portion of the mountain. It is simple to blend such an effect into the background.

For all the open spaces in our layout, we will use window screen supported by wood lath and other scraps of wood nailed in place. No instruction is needed

for the placing of these pieces of wood and don't be too particular about their appearance as they will be covered up. They do not have to be exceptionally strong either as the material we will use to cover them will be very light. No heavy brittle plaster but a flexible, light, easy-to-mix and apply paper mache. If the window screen is supported every six to ten inches that will be ample. When all the wood supports are in, the screen is worked onto it and tacked with carpet tacks. Don't try to stretch the screen too tight or let it be too loose either but let it find its own shape. In some places it may look too smooth—then it is a simple matter to crinkle it a little or form little mounds here and there. Any tunnel portals should be in place as should culverts and viaducts as the screen is tacked around the openings to same and when the paper mache is applied it fits up snugly as real ground would.

Along the track, the screen should be right up to the track roadbed. Drainage ditches on each side of the roadbed should also be formed. These do not have to be deep but they certainly add to the appearance of the right of way. In forming all earth contours, try to picture in your mind how they will look when finished. Remember that soft dirt will not support itself perpendicularly and if any cuts have to be, so plan them to be hard shale or a rock strata of some sort. If the apparent excavation is made in soft dirt or sand, then a retaining wall should be planned for in order to prevent slides.

While working on all the preliminary steps, it might be well to prepare a batch of our "goo." First, get a stack of old newspapers and set yourself down comfortable beside the stack and start

tearing them up into small pieces about an inch or so square. Drop them in an old bucket or wash tub. Next pour in enough water to cover and let it soak—a week is none too long—and the mess should be well soaked up so that the paper loses its identity completely. The next addition is flour, put in several handfuls, enough to smooth up the mix, and work it up good with your hands. Then add more but don't allow it to get lumpy. If it gets too sticky, add a little more water. The measurement of the ingredients is not too critical and it seems to work well no matter how it is mixed. The main idea is to get the mix smooth enough so that it is easy to apply over the screen.

Now for color. I try to get my mixtures a shade of neutral ground color. I know there are all sorts and shades of ground, but I think a sandish light brown, very light, is good for most purposes. Some areas will be grassy and others a darker shade which can be colored up later. Cuts are light so that our basic color will be ideal for them. A dark oak varnish stain applied to the mix will give you the proper shade. Make it considerably darker than you want because the stuff dries several shades lighter. You might experiment with a small patch somewhere which you can dry under heat, otherwise it takes several days to dry. I have experimented with water colors but was never able to approach the stain for a realistic ground shade. Also the varnish seems to increase the adhesiveness of the mix.

To apply it use a putty knife and spread it on just thick enough to cover the screen well. A small paring knife is useful also for getting into the corners and other small places. Try to eliminate all the edges left by the knife by working up and down and across. Try your hand at carving or tracing little erosion marks on the sides of embankments; you will be surprised how well they will show up. You don't have to be an artist just take a screwdriver and drag it down in an irregular line. Then make another more or less parallel to the first line. Make some shallow and others a little deeper. If you want one exceptionally deep, build up a little more goo in that place and form it into a little gully. Try some parallel lines horizontally across the face of a deep cut to represent rock strata. Every here and there have a small break or slippage in the symmetry or general flow of the cracks. These lines will generally be cleaner cut and finer with perhaps a large crack or fissure here and there. Make them with a sharp knife. Stick little pieces of wood or small rocks for outcroppings and cover them with the mache mix.

Don't overdo the rock business. Usually where there are rocks there will be a lot of them in the same place so don't just stick a large rock about the scale size of a ten story building on top of every hill because it will not look good. You might have a small pile of rocks (real ones) scattered about at the bottom of a cliff or in a stream

bed but keep them very small in size for the most part. They should be well rounded and smooth like small scale boulders if placed in a stream bed—as though they had been washed down by flood waters and tumbled around against each other until worn smooth. Some fine sand should also be sprinkled in the stream bed—while the paper mache mix is still wet, try a little real dirt sprinkled on it. Use various shades in different spots.

For grass, try very fine sawdust stained various shades of green and brown. Stay away from the bright greens, use Tintex textile dye. This is a water soluble and costs about ten or fifteen cents a box. Mix some dry-looking dirty yellow to simulate dry grass or weeds and some of this dirty yellow might be added to your meadow grass to take away from too much green in one place. Most grass is a shade of yellowish green anyway. After the mixture dries which will take from two days to a week, depending on how thick it is and also on the weather or the humidity, you might borrow the wife's vacuum cleaner while she is out shopping and remove the surplus sawdust and sand.

The slow drying qualities of this paste makes it nice to work with. You can do what you feel like in an evening and then quit until the next night. What is left in the bucket will keep almost indefinitely until it is applied if you keep it good and moist. Also, you can make changes in it the next day after it is applied to the screen if you wish. Another big advantage is that even after it has dried and set up hard, it is very easy to tear out for another track, building or whatever change is desired. Tin snips will cut right through both screen and mache. Also it is so light in weight that it adds practically nothing to the over all weight of the layout, consequently will not cause sagging of the roadbed or any other part of the layout, yet is fairly flexible and plenty strong enough to last for years—which it has on the two layouts I have already built.

One more suggestion—try to make all of your scenery blend in together. Build up the ground level somewhat irregularly around buildings, culverts, etc., so that the effect will be that the earth was excavated for the structure foundation and not that the building or culvert was merely set in place. This will do much to take away the artificial appearance otherwise created. Place all structures in logical, strategic locations.

About the Author

Our model railroading activities have been somewhat interrupted for several months due to moving and getting adjusted in our new home—but now we are ready to take up where we left off and I do hope there will not be any more "revised schedules."

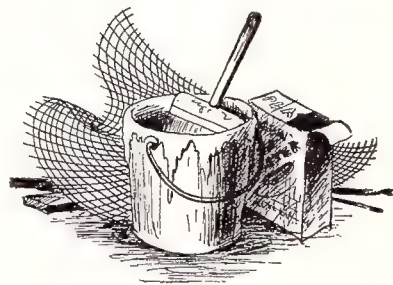
In this interval we sold our former home and moved into a new, larger one, made to order. In back of the two car garage, an open space was purposely left—12 x 24 feet. It is between the garage and the asphalt under the wife's

six wire clothes line. This will be the future home of Pacific Valley Lines. What gauge? I do not know at this time but I think I will try a larger gauge, not because I think HO too small to be practical—I've already built and operated two HO layouts—but because I want to hear the authoritative click of the wheels of heavier cars and locos on the rails and also want to try for the greater detail possible on larger models. So you see I am now in the same category as the readers, perhaps I should say beginners, to whom these articles on Getting Started have been directed.

What gauge? What vintage rolling stock? What design and shape should the new layout be? Point to point, continuous, out and home, branch line, main line, freight, passenger? Shall I have lots of switching facilities with just a hint of main line track enough to get in and out of the yards or terminals or shall the terminals be subordinate to the main or branch line itself? I would even appreciate comments from you fellows, especially those of you who have been reading this magazine the past four or five years and may have enjoyed following the fortunes of the Pacific Valley Lines.

A few ideas are struggling in my mind for recognition as are several long suppressed yearnings. One of these is to have a layout with two or more control panels. This gives friends a chance to participate. I would like to run trains on some sort of a schedule and be able to do it without having to keep an eagle eye peeled to prevent collisions. This calls for some sort of automatic train control or at least an efficient type of signalling indicating track occupancy. I know that working signals will definitely be on the list, also working headlights and marker lights. I had them in HO and also working signals. Even had a working crossing signal. I do think I can make all these things a little truer to scale and more true to life in a larger gauge. I'd like to put a little interior detail in cabooses and passenger cars, not too much, but enough to take away the deserted appearance that most of them have. Shades on the windows and concealed lighting in the ceilings. Had that in HO, too, but it was a little chore! Locomotives must start slowly and ponderously as the real ones do and they must stop the same way as though there were tons of inertia to overcome. This almost certainly calls for fly-wheels on the motors but whatever it calls for, I

(Continued on page 42)



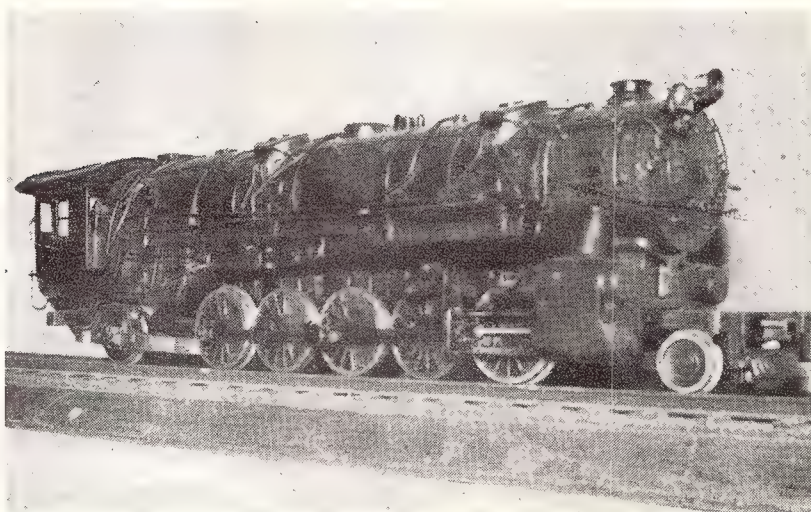
Baltimore & Ohio S-1a

By **BOYD J. McWHORTER**

HAVING been a model railroad enthusiast for the majority of my life, I have built many locomotives from scratch in "O" gauge and remodeled others, in almost every case I was somewhat disappointed with the results. It seemed that the engines, to a critical eye, lacked something which I could not quite point out, but something definitely lacking in the way realness which belonged to the prototype and which the models did not have. This was especially true of all models of the larger engines. In old engines of the 80's, ten-wheelers and the smaller breed, it is not noticeable—but when you make a model of a Malley, Santa Fe or any of the large modern engines, it is usually present in the finished model—a lack of realism. I not only see this something in models made by private builders but the same thing occurs in some custom made equipment.

Having pondered over this trouble for several years, I decided to see if it could be remedied. Being an ardent B & O fan, I chose the famous S-1a for the experiment and used plans from the May '40 Craftsman as a basis. At first it was my thought to build everything from scratch with the exception of the drivers, but being continually inconvenienced from my model railroading by business demands, I decided to use an Adams cast bronze frame. As my lathe and best metal working tools had been sold some time before, the frame and five pairs of Athearn drivers were farmed out for drilling. To speed up the job still further, I used an Adams pilot casting and cylinder block casting. With the pilot soldered to the frame, the cylinder block was soldered on, but to further strengthen this assembly, a hole was bored from below through the frame and into the block, threaded 2-56 and a screw put in.

The block was bored and the cross-head guides mounted and securely soldered before the block was mounted on the loco frame. Again I went to Adams castings for side and main rods and cross-heads. These castings were cleaned up nicely with a fine file, fitted and as they were brass, I had them rhodium plated to simulate steel. I then used Adams bronze bell cranks and from there on built up my own valve gear from brass, using the method as outlined. (An Adams



bronze Baker Valve Gear frame was also used—it was soldered to the cross member which was fastened to the main locomotive frame by two 2-56 screws—see sketches on opposite page.)

VALVE GEAR PARTS

Parts for the valve gear were roughed out of .10 stiff brass, as shown on the sketch, and sweated together. Pin center distances were then taken from the blue print of the engine with sharp pointed dividers and the parts finished to size. I believe most models just have a slit in the valve slide to simulate the part—on my model, I made a slide by soldering two tiny pieces of brass on the sides of the slide seat thus making a slide way. These pieces were about $\frac{3}{32}$ " x $\frac{1}{8}$ " x $\frac{1}{4}$ ". A slide block was then made to fit in this assembly. A slit was cut in the block for the connecting valve piece to work in, with a hole bored through and a piece of common house pin secured by slight soldering at the outside of the block. The slide rod was soldered in a shallow hole in the front end of this slide block.

To the best of my knowledge, the S-1 and S-1a's were originally made without any lubricators but these have since been installed on some of them. I made a working imitation of a lubricator by cutting a stiff piece of roofing metal as shown in the sketches and soldered this on to project above the slide. A second small piece bent down at both ends rests on the first piece, a brass block resting on this and the whole assembly sweated together. A small hole was bored through the blocks to receive the lubricator arm which is soldered to the head of a large "straight pin." The pin was cut off at the back and slightly *rivet headed* so as to work free. The lubricator arm is con-

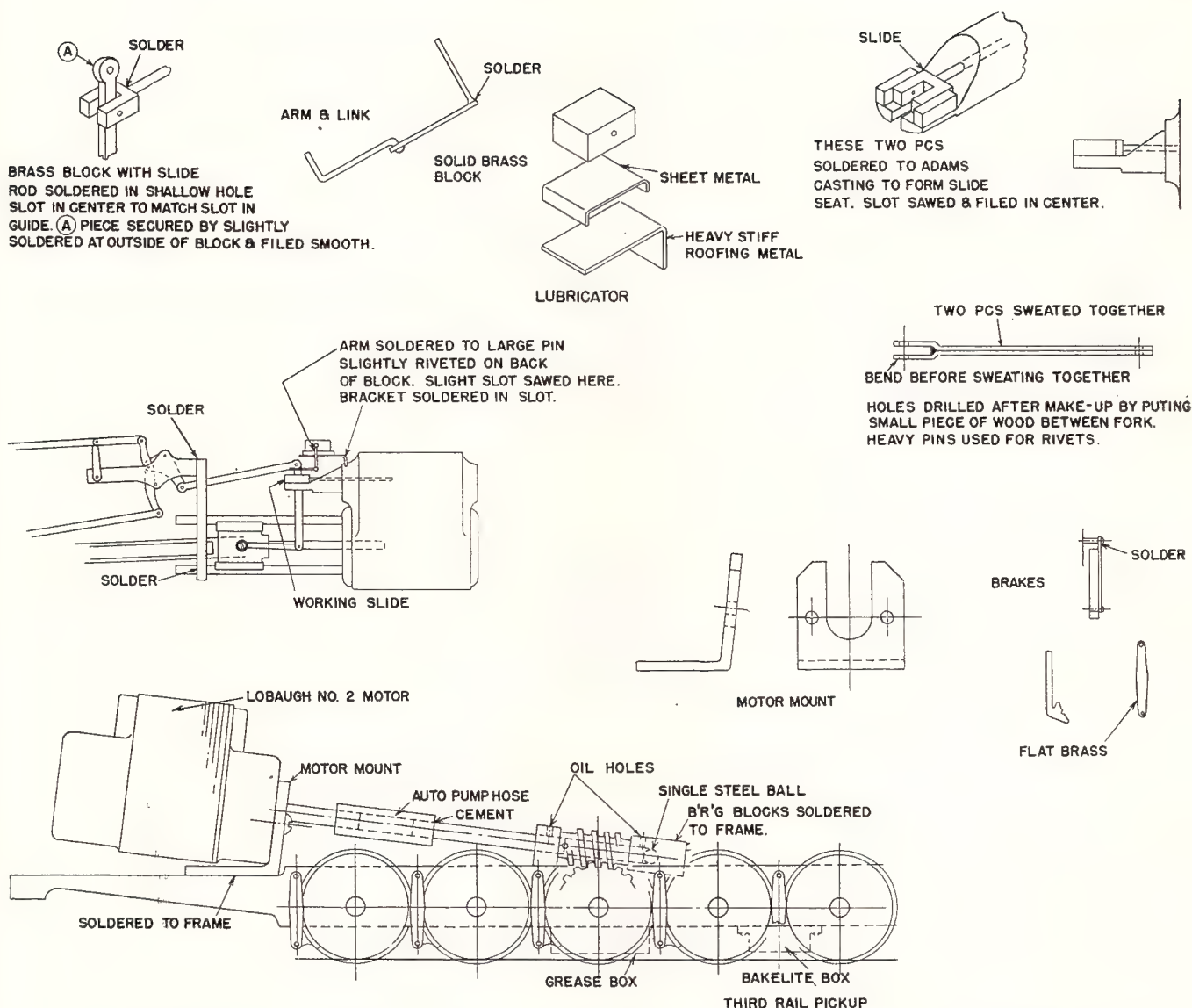
nected to the main valve gear by a small ordinary pin with temper drawn so that it bends easily. The lubricator arm then works slightly with the valve gear.

I presume all the Adams castings used on this model can be procured through most Model RR Dealers however mine were obtained from Carrols MRR Supply, 1215 Grant, Ft. Wayne, Ind.

MOTOR and DRIVE

After the valve gear was completed, I obtained a Lobaugh No. 2 Motor and a 30 to 1 gear set. The worm is of polished steel and the gear of bronze (Boston Gear Works) with concave teeth to fit the worm snugly. For a thrust bearing, a round piece of brass rod $\frac{7}{16}$ " and about $\frac{3}{4}$ " long was used. A hole was bored in this to fit the drive shaft which is $\frac{3}{16}$ ". This hole was bored about $\frac{1}{2}$ " deep, right in the center of the piece, and a ball from a bicycle bearing was put in the hole so that the end of the shaft was bearing against it. A $\frac{1}{16}$ " hole was then bored in the side of the brass bearing block for oiling purposes. The back bearing used on this model was a practically square brass block.

The worm was then secured on the shaft by a steel pin with the shaft resting against the ball bearing and the worm just clearing the block by about $\frac{1}{32}$ of an inch. This assembly was soldered to the frame by filing a round depression in the frame cross-member to receive the front round bearing and filing the rear square bearing until the worm and gear fit properly and the shaft slanted slightly up. The motor was mounted on a piece of angle iron with two screws as shown on the sketch. The angle iron was soldered to the locomotive frame as shown. A $\frac{3}{4}$ " gap was left between the shaft and motor shaft for the universal joint. A



piece of automobile tire pump hose was used for this which forced the shafts, with cement, on tight. Rectifier was wired up on the motor according to standard hook-up. The Lobaugh motor is large and can't slide down much so the gear is on the center pair of drivers. Motor and rectifier fills the fire box and cab. The worm can be taken out easily by simply removing the pin.

BRAKES

Dummy brakes were installed on this model and pieces of flat brass were cut out to simulate the brake hangers. A piece of $\frac{1}{8}$ " brass was then filed to shape to form a brake shoe on the lower end. This piece extends upward between the drivers and is filed wedge-shape with a curve to fit between the drivers loosely. This piece is about $\frac{1}{8}$ " shorter than the flat piece. The flat piece is soldered to the front of the heavy piece as shown in the sketches. A hole is drilled in the top of the flat hanger for a 2-56 screw and also a hole in the locomotive frame, tapped 2-56. A screw goes through the hanger and into the frame. With the assembly in proper position, the surplus screw is sawed off and the hanger soldered to the screw which makes a firm job.

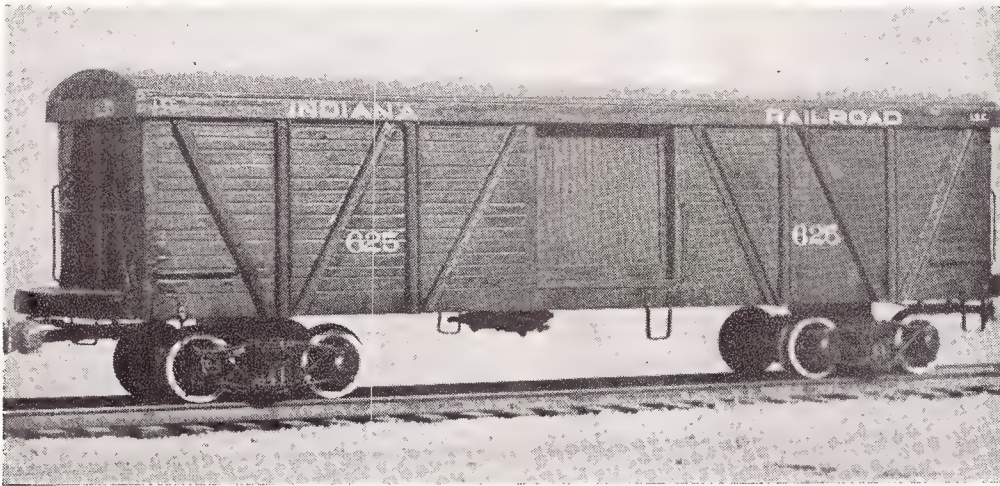
When these hangers are placed, they of course, have to just clear the main rods. The hangers between the first and second pair of drivers don't show much and as this was a three-rail job, I sawed off these hangers and installed the pickup there. A piece of bakelite screwed to the frame was used for the pickup, and a hole was drilled through the bakelite to take a short piece of speedometer cable. (After much experimentation, I have found that old speedometer cable makes the best and most certain pickup.) Another small set screw was put in the bakelite, screwed in tight against the pickup and the pickup wire was soldered to this screw-head. The cable extends about $\frac{7}{8}$ " beyond the drivers and is smoothed up at the ends by a drop of solder.

BOILER and CAB

When making the boiler and cab, I digressed from the usual practice of making everything as near scale size as possible. As a base for the boiler, a piece of brass tubing was used which was about $1\frac{3}{4}$ " O.D. The back end was filed down slightly to get the necessary drop at that point and from there the contour was

built up by wrapping the tube with sheet metal. This was bound on with wire in sections and soldered, the seams afterward being covered with the finish bands. Instead of making this boiler to accurate scale size I made it a little oversize purposely. So as not to overdo the thing, I went about $\frac{1}{16}$ oversize. In mounting the cab, instead of following the prototype plans, I mounted the cab about $\frac{1}{16}$ " lower and gave it a very slight backward slope. Soft sheet brass is best for building up the boiler shape and stiffer brass for the cab. You will also note the extra cab window on the left side—this has been built on a number of the prototypes. The front end brakeman rides here.

I spent a great deal of time on the boiler and cab to give them the right appearance. You'd be surprised what a big difference in looks a small fraction of an inch can make in a model. I find that the appearance of an engine depends to a large degree on the boiler job. The bottom of the firebox is open and fits down over the motor with the ash pan under motor. One screw at the back end, one under the cylinder block and one small spectacle screw connecting the reverse gear are all that have to be taken out to remove the superstructure.

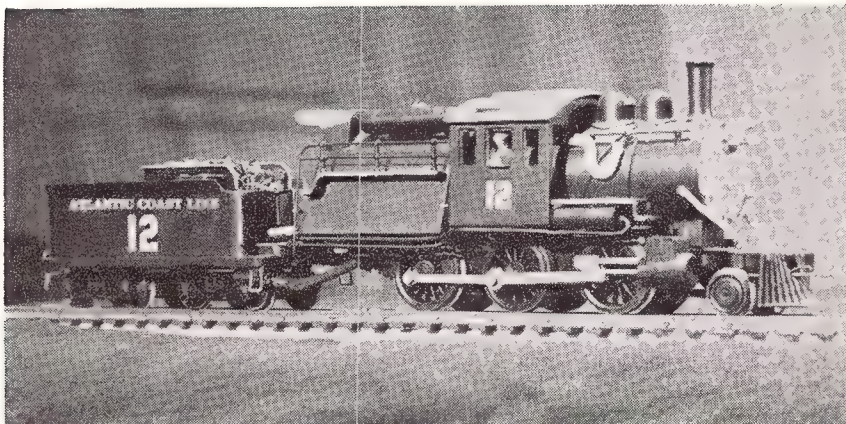


← O Gauge model of an Indiana Railroad Interurban box trailer. The only purchased parts were the couplers and trucks, the body is from an orange crate. This hand-lettered car was built up by Donald Mather, of Wabash, Indiana.

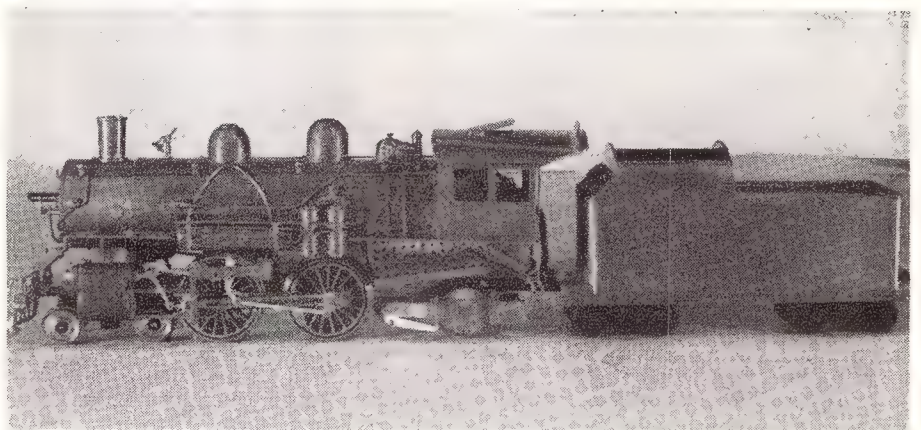
YOUR NABOR'S PIKE

WANT THREE BUCKS?

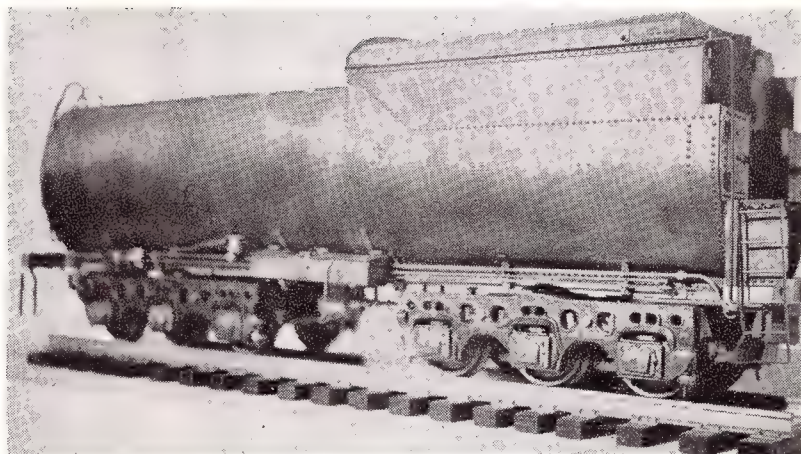
That's the minimum we pay for photos and captions appearing on this page. Photos are selected on a basis of reader interest and good photography—you are not limited to some super-detailed model so don't be bashful, your photo may be the next to appear on these pages. Please include all pertinent information regarding scale, materials and other interesting facts. Here's a good chance to let your "Nabor" see your work and make some easy money in the bargain. Send material to Picture Editor, Model Craftsman, Ramsey, N. J. Photos returned on request.



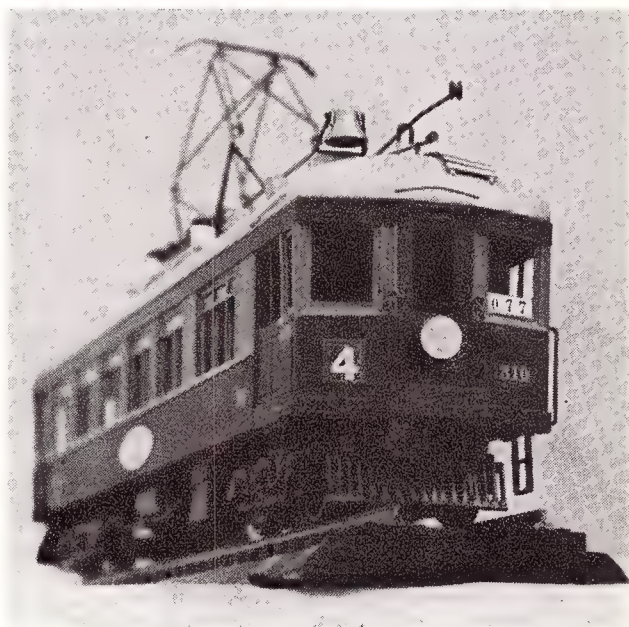
↑
A Camelback built up from a Mantua 8 Ball Mogul Kit. This HO model is the work of Fred Noesner, Irvington, N. J. Also out of the Atlantic Coast Line Shops in HO Gauge is the Chicago & Northwestern 4-4-2 shown opposite.



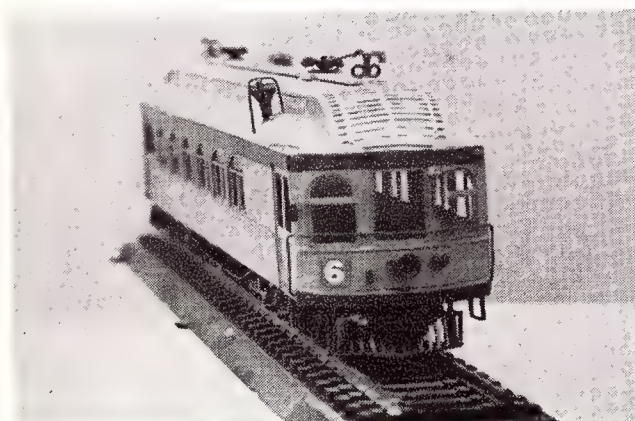
3/4" scale model of a Vanderbilt Southern Pacific Tender built by Jack Fesco, of Los Angeles, for a 4300 class Mountain Type 4-8-2 live steamer. It boasts 1500 rivets, automatic couplers, fully sprung trucks, working hand brakes and all accessory parts. Completed in 700 hours. ➔



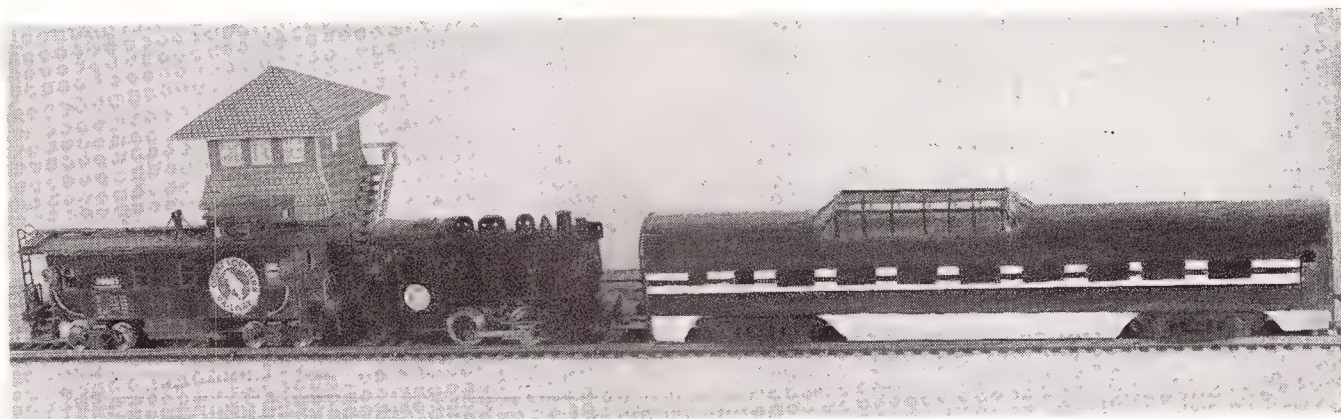
➔ Free Lanced Sacramento Northern 1000 class car in O gauge by Bill Kee, of Inglewood, Calif. This is a motor car of 3 car train, "Purple Sage."



60 foot freelance combo patterned after the 1910 vintage Niles also on Bill Kee's O gauge line. ➔

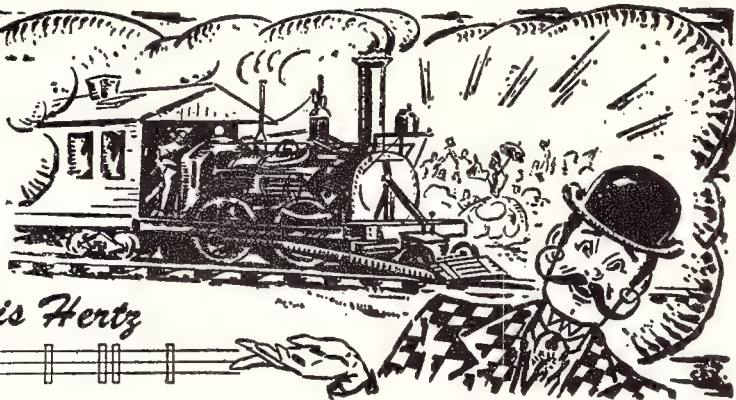


A Varney Switcher is shunting a newly made Vista-Dome car over the East and West Railroad. Jerome Harrison, of Nanaimo, B. C., built up the car in HO gauge from plans appearing in the Craftsman. Photo by Hamilton. ➔



MORE ABOUT PIONEER Model Railroading

along the tinplate track with *Louis Hertz*



OUR article on Pioneer Model Railroading in the November 1948 issue was rather in the nature of an exploration into a by-way of our subject into which we had not previously ventured in print. We were, therefore, especially pleased by the impressive interest which was almost immediately expressed in the material presented at that time.

The substance of many of the letters commenting on the November article was to ask for more along the same lines if possible, and, in this issue, we will try to comply. The subject is, as noted in our first article, a somewhat neglected one, perhaps chiefly because most model railroaders have felt the hobby as such was so recent that they assumed it was non-existent prior to the turn of the century. Of course there was no widespread hobby as we know it today and it is for that reason that the drawings, instructions and references to the subject are to be found in a variety of obscure and often unexpected sources.

The building of railroad models and of model railroad systems of sorts, has been practiced from the inception of the railroad. Some of the earliest treatises on railroad construction, published in the 1830's, tell of extensive experiments in railroad problems being carried on with the aid of models. Numbers of early patent models of locomotives, cars and other equipment have survived—some of the most important of the early models of the United States Patent Office are on display at the Smithsonian Institution. Since the dispersal of the remainder of the Patent Office model collection, a good many other early railroad patent models have come into private hands. Some are fine handmade models, while others are doubly interesting because the inventor used a contemporary tinplate locomotive or car as the basis of his model. Such pieces, being definitely dated, have been of much value in the study of tinplate history.

It is possible to find quite a number of early contemporary references to model locomotives. During the Napoleonic Wars, John Blenkinsop suggested the use of steam locomotives to haul coal from a mine he managed near Leeds, England. Matthew Murray, of the firm of Fenton, Murray & Woods, of Leeds, was commissioned to design a locomotive. Blenkinsop suggested using a rack on one of the rails in order to overcome the grade between the mine and Leeds.

The first Blenkinsop or Murray, locomotive was put in service in June, 1912, and three more of the same design were shortly thereafter placed in use and proved remarkably successful. Thereupon Murray constructed two models to a scale of one-twelfth, each mounted on a short length of miniature track. One of the models was presented by Murray to Blenkinsop who used it to demonstrate the workings of the locomotive to other mine operators. The second model was presented by Murray to the Czar of Russia in an effort to introduce the railroad into that country.

The model presented to Blenkinsop survives to this day in perfect condition. It was given in turn by Blenkinsop to R. Embleton who succeeded him as manager of the mine and it remained in his family until after the death of his son when it was sold at auction. It was then purchased by Philip N. Rosenbach and brought to this country.

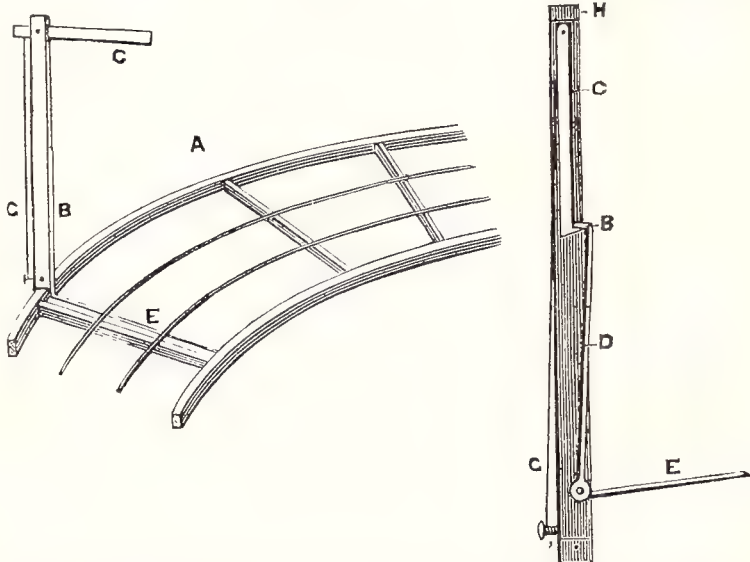
In 1825, two American engineers, Horatio Allen and William Strickland, were sent to England to study its railroads by the Delaware & Hudson Canal Company and the Pennsylvania Association. Strickland was instructed to procure all possible data on the methods of construction used, the costs and particularly on motive power. In fact, the society's confidential letter of instruction to Strickland (March

25, 1825) was quite explicit about what they expected:

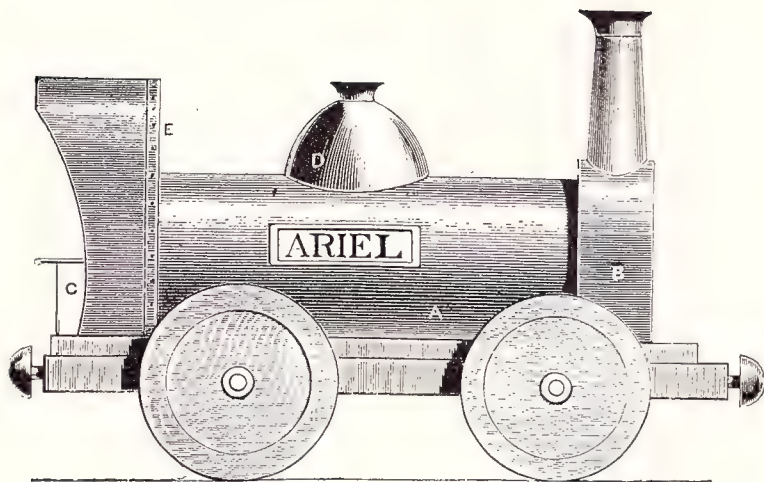
"... Locomotive machinery will command your attention and inquiry. This is entirely unknown in the United States and we authorize you to procure a model of the most improved locomotive machine at the expense of the society."

Strickland carried out his commission faithfully and when he returned to the United States in 1826 he brought with him a model of an English locomotive. His comprehensive report on British railroads (and canals) was published by the society in a limited edition at ten dollars a copy and, with its seventy-two superb plates of every phase of railroad construction, it had a profound effect on public opinion and provided a definite basis for further action. The model locomotive that he had brought over eventually came into the possession of the Franklin Institute of Philadelphia.

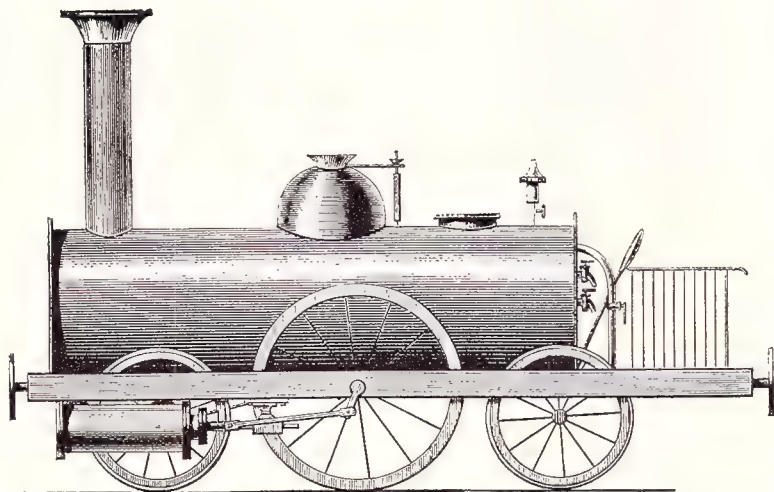
In the early days of the Baltimore & Ohio Railroad, experiments were conducted with a sailing car invented by Evan Thomas. The car was fitted with a single sail which could be raised or lowered and ran perfectly when the wind was right. Many people came to view the car, including Baron Krudener, envoy from Russia. On an invitation from Mr. Thomas he made a trip in the sail car and managed the sail himself. William



Automatic signals for model railroad use are not recent innovations. This automatic semaphore (it had to be reset by hand) was designed for use on live steam railroads more than sixty years ago.



A simple wooden locomotive model, consisting of little more than the essentials, yet unusual in that the presence of the cab would seem to indicate a later general prototype than the more elaborate cabless models illustrated from the same book.



An elaborate working model, slide valve, live steam locomotive for which instructions were included in Rev. Lukin's book. This was his most elaborate locomotive model. It was to be constructed from brass, and was described as "a superior toy."

H. Brown, the early railroad historian records that: "On his return from the trip, he declared that he had never before traveled so agreeably. Mr. Thomas caused a model sailing-car to be constructed, which he presented to the baron with the respects of the company, to be forwarded to the emperor. This courtesy on the part of Mr. Thomas was handsomely acknowledged by the baron."

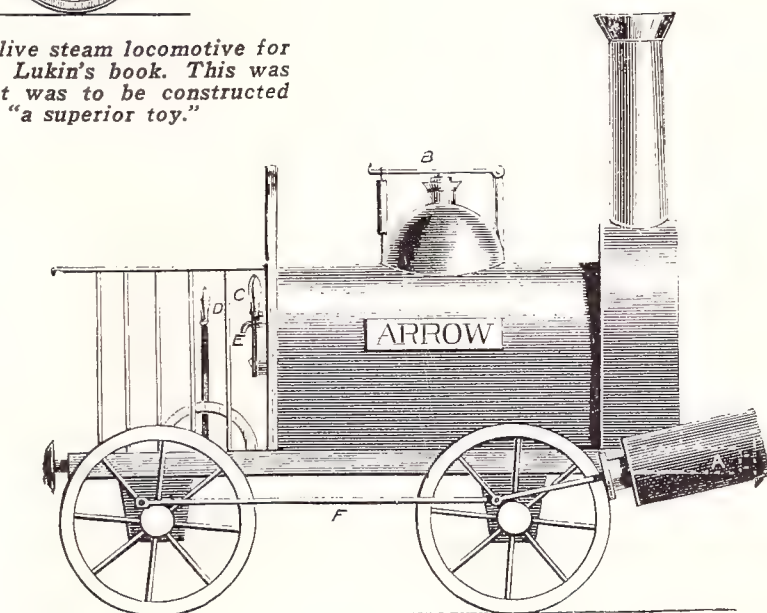
Limitations of space prevent our mentioning every early model locomotive or railroad system which can be authentically traced back to the earliest days of railroading, and we have therefore confined our references to two or three high spots or unusual items. A number of others could be cited, and it is not unlikely that in the future still additional instances will come to light. It is probably fairly well known among railroad enthusiasts that Matthias Baldwin's first locomotive was a model constructed for demonstration in Peale's Philadelphia

Museum. There are cases of model railroads being carried around the country in the 1830's by various promoters and showmen. The promoters were, of course, trying to build up interest and raise funds for the construction of railroad lines. The showmen were using the railroad to amuse.

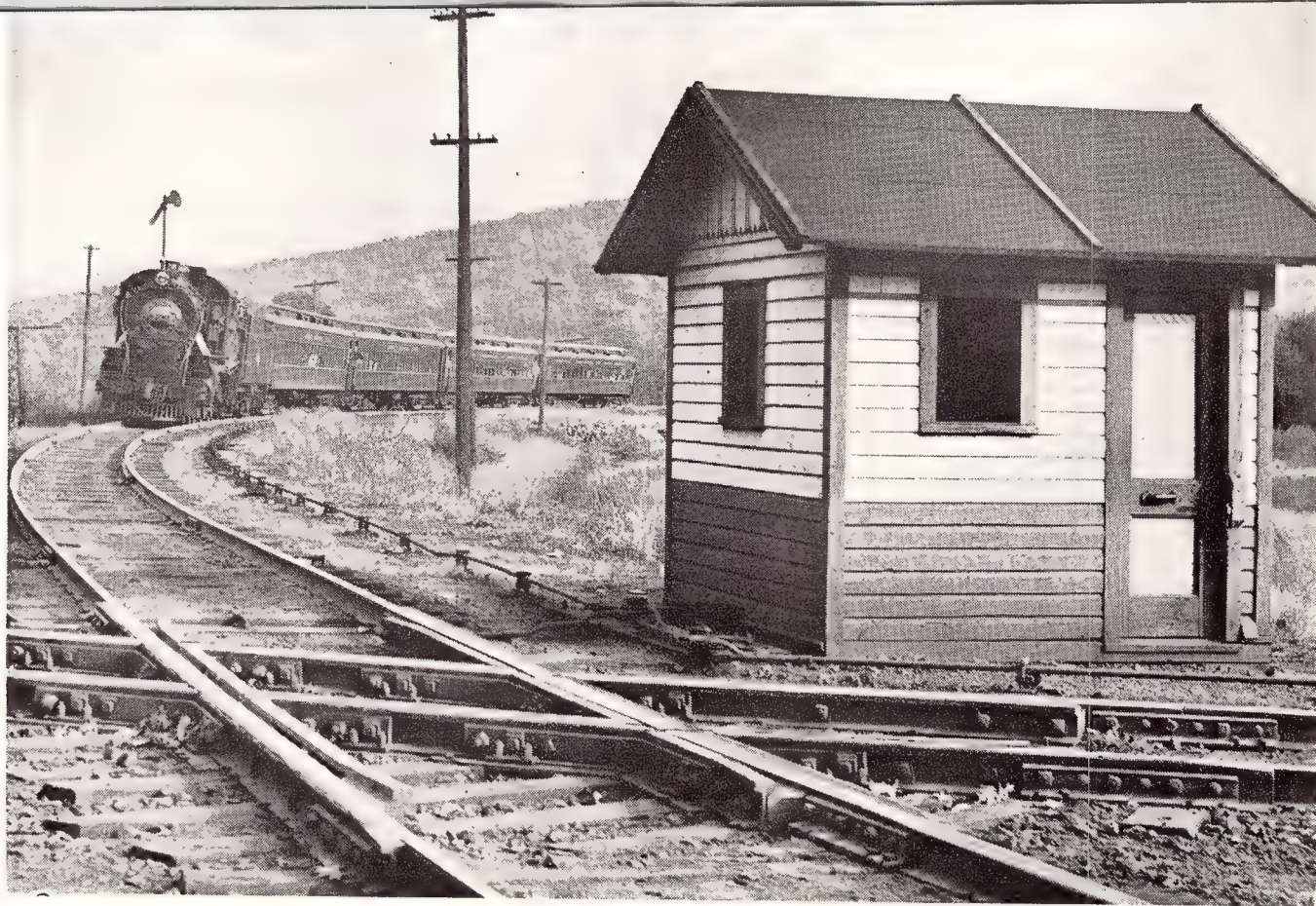
An enterprising Kentuckian, Joseph Bruen, deserves mention here in this connection. Bruen carried his model locomotive and its few rods of portable track around from town to town in a Conestoga wagon in the 1830's. When he reached a town where he planned to show his railroad, he hired a local man to help him set up the track and equipment. He charged a small sum for a ride behind his locomotive, and, happily enough, his venture was said to have been a financial success.

Obviously, such early models as Baldwin's, Bruen's, etc., were substantially larger in size than we are apt to think of most model railroads today, and were to a certain extent more closely related to the little passenger-carrying railroads in amusement parks. In the 1840's and 1850's, however, model locomotives more in line with our modern conceptions came into being, and their manufacture was soon being carried on by several manufacturers in England and France. Some were very crude reproductions, while others were extraordinarily fine models. Some conception of the variety of quality may be had from the fact that in the 1860's and 1870's the price range of model locomotives stocked in London shops was from 2 to 100 pounds, according to a book published on the subject, "The Model Steam Engine, How to Buy, How to Use and How to Construct It."

This work was published in London and covered all sorts of steam models, (Continued on page 43)



A rather elaborate wooden locomotive model, fitted with dummy controls, as pictured in Rev. James Lukin's early book, "Toymaking for Amateurs." This model was designed with oscillating cylinders, which would seem to suggest it was intended more as a replica of a live steam model locomotive than a direct copy of a real engine!



A rail fan special approaching the signal cabin at Lake Junction. This clearly shows the signal rodding and crossing frog.

Jersey Central's

HIGH BRIDGE BRANCH

This month we take an imaginary ride over this famous branch line. Refer to the January issue for a complete map of the branch including all sidings, crossings, yards and other railroads.

By WARREN B. CRATER

Photos by A. Q. Vogel

LAST month we described the 33 miles of single track which forms the Jersey Central's High Bridge Branch. Instead of taking the usual fan trip, let's ride the big Diesel which pulls the ore train over this old line. This train, which is designated by the Symbol AY 2 and in the opposite direction to the ore movement, originates at Allentown, Pa., yard. It has moved eastward on the main line to the west crossover at High Bridge. The conductor has received telephone instructions to cross over to the yard. The train then pulls through the running track to the Main St. crossing. Cars from Jersey City and Elizabethport which have been left by the westward are picked up and matched in the train according to destination. This work is done from the main track without flag protection as it is within yard limits.

The train is now ready and the brake test has been made. The conductor comes from the "Telegraph Office" with the "Train Order" and "Clearance Card." He has just filled in the "Train Register" in the 'phone booth at Main Street crossing. This is a form on which he registers his train, engine number and the train crew's names. The Clearance states the number of train orders and that there are no further orders for his train. After orders are read, he shows the time departed on the register and we are on our way.

The head brakeman flags the street crossing until the Diesel blocks it, then he climbs up into the cab. The upgrade and the tonnage holds the big Diesel to somewhat less than the permissible speed of 30 mph. We pass the end of the High Bridge Passing Siding and the yard limit

board along a very heavily wooded side-hill. At places the steel mill may be seen, through the trees, in the valley to our right. Then we find a slow board and a short curve to the left from which we run directly on to the Gorge Bridge. Then a curve to the right, carved out of the Gorge wall itself, where we are even with the tops of big trees. Some more curves and intermittent tangents bring us out in the broad valley to the small village of Hoffman's. On our right where the old passing track provided for meeting of many trains which could not go to High Bridge ahead of superior schedules, is now only a drainage ditch. The old peach basket factory does not have a track or show any signs of life, which is very much in contrast to the activities there just a few years ago.

After running another mile and a half

through farm country, with the river to our left, we pass through the somewhat larger town of Califon which in former years loaded out several cars of milk for old 910 to pick up. The passing track is to our right and the house track to our left. The unpretentious frame freight house is very much in contrast with the old stone passenger station. This apparently was built from native field stone when the branch was built. It now houses the Western Union and Railway Express Offices. We continue up through what is left of Vernoy which is, on the railroad, just a curve with a slow board approaching from each direction and a road crossing. Vernoy is a farm village which is well off the highway. Another mile groans under our wheels as we approach the highway at an acute angle on our left and cross it at the grade where Crestmoor Station once stood. This is just a road crossing and the station was only a small shelter.

Our Diesel grunts through the flat meadow bottom of the valley and over a slow level steel deck span bridge across the river. We then come to a long right hand curve through the village of Middle Valley. The station and passing track are gone. A short spur track and crossings of dirt roads still remain as does a level cinder patch which marks the former location of the defunct facilities.

Vernoy, Crestmoor and Middle Valley are now shown in the current time table of the Central.

We continue along the meadow bottom with the river in sight, to our right, for three miles to the town of Long Valley where our hogger pulls our speed down to six miles per hour over Main Street crossing. The frame station is just beyond the crossing and to our left. Opposite is a warehouse with a short spur and a coal trestle coming off the spur. Then on our left is a large creamery with its spur off the passing track and the junction switch to the Chester Branch leads off to our right. Long Valley formerly contributed largely to the milk trains consist, but today we see several trucks, backed up to the creamery's platform, with the names of many of Metropolitan New Jersey's towns and cities lettered on their bodies. This needs no explanation.

About a quarter mile up (and I *mean* up) the Chester Branch we see the old iron lattice girder bridge over the river. Although we leave the river to go over into another watershed, the grade eases up and our Diesel can handle the tonnage with less grunting through the continuing valley farm country.

Slow boards for the curve, a dirt road crossing and a short spur for which there is no apparent excuse is all that mark the spot which was formerly designated in the timetables as Naughtright. We are now running through a heavily wooded section which opens out to a clearing which reveals the remains of Bartley. The village is still there, to be sure, but we are awed by the morgue-like revelation which is so obvious that it draws our attention. We pass a dirt road crossing

with weed grown spur, then a second spur which goes off through the weeds to an abandoned building. Next we pass the old frame station (illustrated Jan.) which is boarded up and sags in the middle, not unlike an old wooden gon.

More woods and then the town of Flanders which was a large supplier of milk to the cities. Flanders, a sizable village, has done a better job of remaining intact than some of their neighbors. The passing track, now industrial, is on the right and the frame station, in good repair and recently painted, on the left, still shelters an agent-operator.

There he is, no his name is not Handle-Bar Hank, reaching for the red flag on the long pointed staff. He does not mean to stop us, but if we were riding the caboose we would see him plant the flag in the middle of the track and look at his watch. What for? He will, as the rules require, hold any following train until five minutes after we have passed.

We continue through the woods and over the little road crossing which marks Carey's and on into flat open land with hills away to both sides, to and through Ledgewood. We cross a highway and see a short spur and a passing track, then over a secondary road and around

a curve, pass a Yard Limit Board and cross another highway at Kenvil. The station is on the right and a large powder plant is on the left.

As we pass a drill engine with several cars in the passing track on our right, the engineer, who has been merrily tooting his horn for road crossings for the last hour, now goes to work with the brake valve. You wonder why, since you can see straight ahead at the far switch of the passing track the first semaphore signal, and it is in clear position. Sand pits, now abandoned, are to the left of us. As we stop just short of the signal, notice a disk on its mast with "STOP" on it. You will also see that the opposite signal is clear and that they protect a railroad crossing. The other road, D. L. & W. Chester Branch, also has semaphores which are in the stop position. This is normal and, when the brakes are pumped off and the crossing is seen to be clear, we proceed. Two storage tracks on our right are partly filled with cars. The hoppers with a small pile of grey, glistening stone and sand in each end contain iron ore. These small piles equal the 55 ton capacity of the cars. The gondolas filled with building sand were also loaded at the mines. We pass large



An ancient water tank at Hopatcong Junction. On the right is the Ogden Mine Branch, the wye is to left.



River Bridge, vintage nineteenth century, on the Chester Branch at Long Valley. The center stone pier is diamond shaped to divert heavy flood waters.

The latest comer in the Branch Line Drill Service on the River Bridge at Middle Valley, en route to its job at Hopatcong Junction.





The Gorge Bridge—Engine 624 reduced to the lowly chore of work train service. In former years, this locomotive hauled the well patronized Lake Hopatcong excursions.

piles of this sand just before we stop at Hopatcong Junction. Here we set out all the empty hoppers and gons and the local freight for the drill engines to handle.

The Diesel is coupled back onto the rest of the train which goes over the Wharton & Northern to Green Pond Junction for interchange to the Susquehanna.

We start slowly on the Ogden Mine Branch around a long curve to the left, pass the old wooden water tank at the Wye switch and stop at a semaphore which is in the clear position. We get off here and watch the Diesel pull over the crossing. The operator hands the orders and clearance to the engineer on a hoop and as the caboose rolls by the conductor hoops up his copies the same way.

As the head end grunts up the grade of the W & N from Morris County Junction we watch the hack and its markers pass the small yard and disappear through the culvert under the Lackawanna's main line.

The track way out to the left from the yard lead goes to the powder plant at Kenvil. We can now see the workings of the crossing and signal layout. The levers are exact duplicates of those in the manual interlocking towers.

When we have another day off we can ride one of the drill engines as it does its local work and places the cars for the eastward Ore Train Y A 1 in the storage tracks at Ferremount Junction.

Motive Power, Past and Present

Locomotives on the High Bridge Branch were assigned to the several classes of service up to the limits of weight restrictions imposed by the bridges. Weight has always been the only restricting factor since side and overhead clearances are equal to, or better than, those

on the main line. More properly explaining, the bridges have been rebuilt or strengthened from time to time to permit the use of heavy power. Today the largest engines can run through over the route of the "Ore Train," however, they are limited to 15 mph on the Gorge

(Continued on page 39)



Railfan excursion train on the Lake Junction High Bridge Branch. In the foreground J. H. Smith, operator-agent, "Plants" the red flag in accordance with Central regulations. (Ten minutes behind passenger train.)



THE LAYOUT DOCTOR

Is your model railroad a smoothly operating pike? Are you having trouble with the design? If you want to receive helpful suggestions on your layout, criticisms that will add untold realism to your pike, send in a sketch of the layout to the Doctor, he will solve your problems and offer many helpful suggestions. Layouts are *Doctored* on a first come-first served basis, however, layouts actually built or under construction, as evidenced by photos, are first.

FROM Paul H. Freimuth, of Havertown, Pa., comes the layout of the Blue Ridge HO Railroad, 5' by 16'7". From this "regular reader" comes also the self-criticism: "I know you'll find plenty to do with this one, you'll probably even laugh at it." Instead of laughing, I want to cry or at least whimper a little bit because Paul fails to tell me, as so many of you do, which sides are against walls, which sides are open, whether the table-work is already erected and so forth. Well, I have gone ahead and fixed up the Blue Ridge Road on the presumption that the front and both ends are open and the back if not accessible from a narrow alleyway can at least be moved out from the wall for work on the tracks when necessary. If the ends are not accessible it means goodbye to the two industrial sidings in the rear corners of the redesigned pike, while an inaccessible back means climbing up on the table to reach the rear tracks when required.

Basically, the original Blue Ridge Road is a good design, inside out figure eight with cross-overs at the front for extra flexibility. This gives a long continuous run with some possible variation. My principal criticism of the railroad is that the yards are entirely too fragmentary: real railroad yards have many *parallel* tracks as long as possible, not just little "twigs" springing out from a "branch" capable of holding only a car or two at best. The hilltop station gives a passing track with relatively inaccessible switches (four feet back from the front). The small lake at right with a large outlet and no inlet is not true to even an approximation of nature.

To fix up this layout, and to dress it up with what I like to think are a little better scenic features, run a third track, a yard lead, between the two parallel and level tracks of the "eight" in the front.

The yard is placed between the climb-

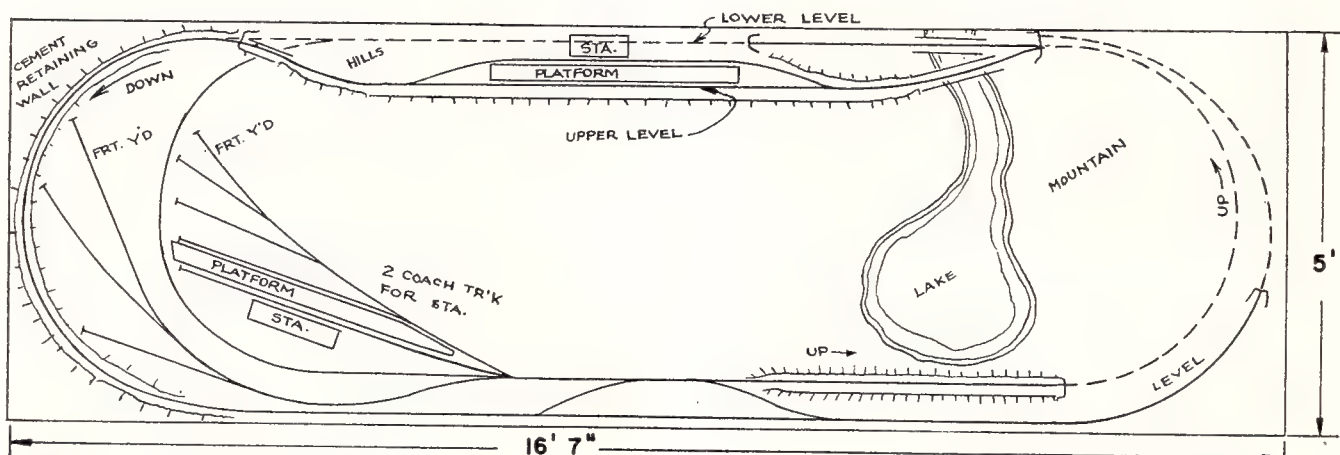
ing and the level main lines. I show six yard tracks, but believe that eight could be had by placing the tracks on minimum center (eleven to twelve feet) and using number four switches. There is room for the rather crowded little wye and enginehouse I used on the Christ layout, but here there is much more room so I have placed the engine facilities across one main line, back of the passenger station. (It is, I admit, not so good to have to cross a main line track to reach the enginehouse from the yard.) A series of four crossovers should take good care of trains entering and leaving the yards. If any are to be omitted temporarily, let it be those farthest right and left. The left hand one should really be back behind the roundhouse to give a little more space on the yard lead, but I have had to put it up front for reasons of access. The extreme left switch of this left hand crossover is a regular switch with "main line" straight, for at this point there is room for a short straight in the long curve.

I have cut the curve radius down somewhat from those that Freimuth gave, namely to 24 inches minimum and feel that this will give as good operation as the 26 and 28 inch radii he specified in his plans. Switches in the yards can be number four or five (for #5's, see page 36) while those put on the line can be number six.

Attention is called to the numerous industrial tracks on the layout. The corners of curves of model railroad radius are natural sites for *sidings* which swing off in un-railroadlike fashion *straight ahead*, while the main line curves, just the opposite of prototype practice. Such industrial sidings provide good places to originate and receive cars, via a way freight and provide even the through freight with a visible means of support.

Should the number of cars outgrow the layout, an additional yard can be added at the *other* end of the yard lead by sacrificing the river scenery. This should be almost a mirrored reflection of the presently redesigned yard.

The layover track, one end of it at least, takes off from the yards in spite of what



SMALL INSIDE CURVES 26" R.

OUTSIDE CURVES 28" R.

Above is the original HO pike of Paul H. Freimuth, Havertown, Pa. On the opposite page is the revised layout as suggested by the Layout Doctor.

one of my critics lambasted me for. Cuts of cars may be shoved back there by the yard goat as "interchange" to be picked up from the same or other end. Through passenger trains or even freights may be routed back on the layover track out of sight and sound to sit until almost forgotten. You will note that this layover track is not hidden in a tunnel which is nice if you can do it, but is down behind a rather steep bank of hills. It might be a good idea to cover those rear tracks with a temporary tunnel of old shoe boxes, minus the ends, to keep the dust off the rails.

A trolley line is shown on the main street of the small town, leading up to a resort at the top of the Blue Ridge Mountains. This might be called Sky-Line House. This resort hotel gives a fine excuse for hauling Pullman cars over a rather small railroad. It might be possible to arrange an interchange switch between trolley and railroad to haul cars of fuel and provisions up to a siding at the hill top hotel. If the railroad is modeled after an old timer, the motive power on the "trolley" line might well be the "Governor" steam dummy described by James Hall on these pages several months ago.

AMONG the most recent lot of layouts I received for "Doctoring" was the Small Valley and Broad Mountain Lines of W. A. Flory, Elizabethtown, Pa. I am giving this layout *red ball* handling, first because of its size—about five by eight feet; second, because Flory has evidently put considerable thought into his plan; and third, because it has an excrescence, an extension, a possible feature of many layouts which I have wanted to treat for some time.

May I define this excrescence as a projection from the main tablework not wide enough to contain a 180 degree curve at the minimum radius of the road. It is often feasible to add one to a completed table or plan for one in building up a framework. Such a shelf may run over a workbench or radiator, into a doorless closet, or across the end of an alleyway left for access to the layout.

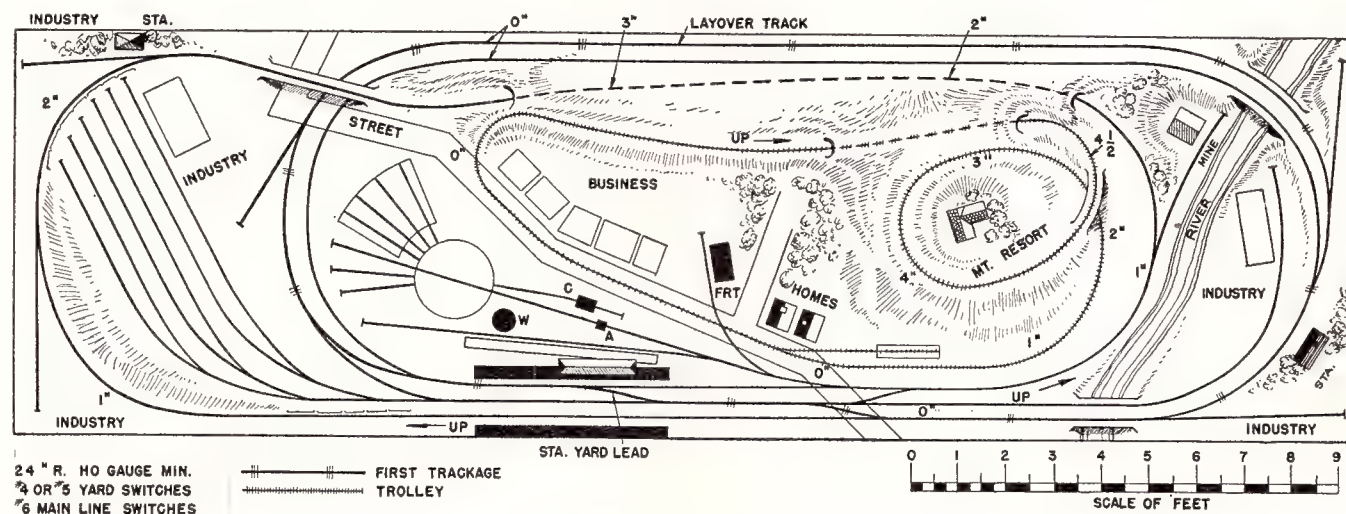
What I would like to emphasize is that any such extension should be utilized for yards, terminals, etc., as much as possible so as to free the main tablework for the village, country and mountain scenery so apt to be slighted if yards, terminals and so forth are dealt with fully.

Flory's layout is essentially an out-and-back system, running from a terminal out around a reverse loop and back into the terminal again. There are really two reverse loops so that one can be used as a layover track on which to hold a train for a while. There is no *provision for continuous running* which I aver is *essential to a good model railroad layout*. There are those (for the most part who do their model railroading from an arm chair) who claim that an out-and-back system on this order is the essence of model railroading because it approximates real practice where continuous running is never possible. Such men have very strong arguments but I contend in all seriousness that there are many times when you just want to let them run 'round and 'round the Christmas Tree, whether it be to simulate a time freight, a fast mail, the Broadway Limited or just to test run an engine. So, lack of an oval is Flory's number one fault. Second comes the scant utilization of the *extension* for yard purposes which forces the yards back to the main tablework and crowds out a village, country or other scenery. Third, many of the switches and the turntable are four and five feet back from the edge of the tablework—I assume that the back edges of the layout are not accessible except by pulling the whole table out from the wall on occasion (which shouldn't be too often). My contention is that the switches of any model railroad layout should all be within reaching distance of the edge—two or three feet at the most. Fourth, there is too strong a use of switches, particularly cross-overs of which I count the equivalent of eight. On the freight lead alone there are four cross-overs! Fifth, I fail to see the reason for that reverse loop around the yards which can only be utilized by *backing* around it. Had this backwards reverse loop been accessible directly, in forward motion, to a train entering the yards, I think

we would have a much better layout since continuous running would then have been possible.

My first point of attack in doctoring the Small Valley and Broad Mountain Line was the extension. Into that thirty inch wide space I have crammed ten parallel tracks and still have room for a few more if I care to do away with a passenger platform and freight station. Starting from the edge of the platform, I have a run around track and an arrival track, both of which serve passenger and freight. The run-around track leads directly to the enginehouse. Across the passenger platform is the passenger departure and storage track, followed by four freight yard tracks, a freight house track and, under a high level street, two hidden tracks which can be the place you shove cars destined for the connecting railroad. All this leaves little room for a station so I have adopted the expedient of having the street at higher level so that the station can also be up high. Passengers step down to the passenger platform and freight is elevated down to the freight cars. Tracks run under the cross street and so give an appearance of somewhat greater length than there actually is.

I have placed the main line at a lower level than the yards. It is paralleled almost all the way around by a second track which is our layover track where trains wait while supposedly traveling to the far reaches of the railroad which the layout represents. Part of the way around there is also a third track which is a reverse loop to get trains headed back into the terminal. Since this loop will be used only once for each run, it may also serve as a layover track. In order to get this loop in I have had to reduce the minimum radius to 18" (which fits in nicely with the #4 switches prescribed throughout), although I think that an inch or two larger would be feasible. From this lower trackage a branch runs up, through a tunnel, across a trestle and into the yards. Notice how the main line (and layover track) paralleling closely the curvature of this rising branch to the yards are separated by a river, even though a narrow one. This lends realism to the scenery.



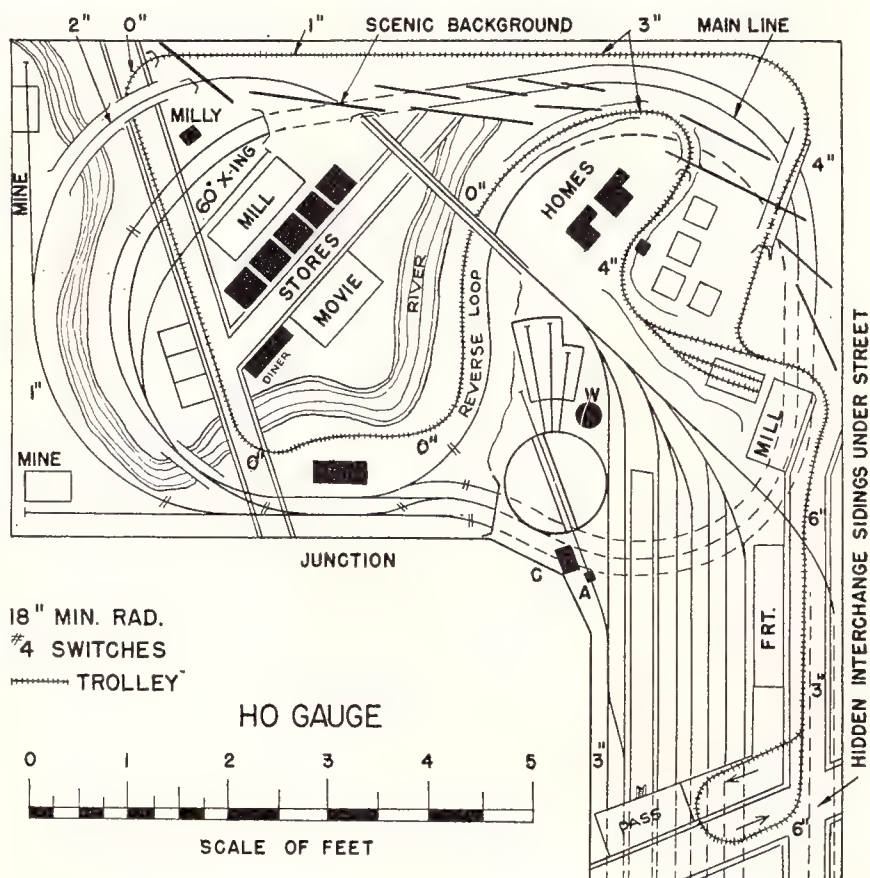
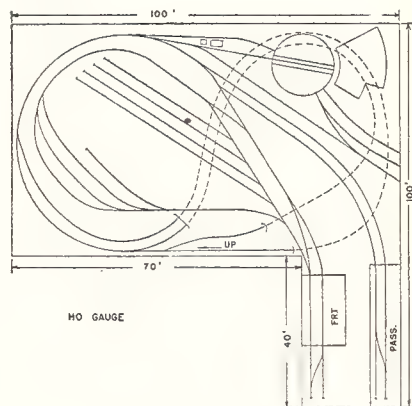
There are plenty of sidings for a way freight to pick up and set out cars so the operation of a local freight need not be discussed. A local passenger can make stops at Junction and Milly several times before laying over on a hidden track for the return trip later. The main line oval and/or the layover track present a chance to operate a "through" express passenger train (with short Red Ball, Mantua or home-made cars) which connects with a local running from the Terminal down, around the reverse loop and back. An express reefer, through Pullman or chair car may be exchanged between such a local and express.

Circuiting is not shown in detail, although suggested gaps for blocks are indicated. The reverse loop *must* be separate. I would suggest separate blocks be made also of the main line, the layover track, the front track at Junction and the yards, although these may be temporarily wired in parallel.

A trolley line is shown running from the Terminal station, along the high level street, then down through a small homes section, down a steep grade to the river valley. It follows the railroad and river to Junction, then takes to the center of the street past Milly and up a hidden grade which brings it back to the high level.

There is one criticism of even the revised layout that someone may be inclined to make, that there is too much hidden main line trackage. To this I agree, although it is accessible for the most part. The front curve can be reached from the edge of the table, then back farther by lifting out the mill or scenery. The rearmost part of the hidden trackage is behind scenic flats or just a plain scenic background such as sold in hobby stores. This can be reached OVER the scenery, or from the rear by pulling the whole tablework out from the wall a foot or so. A "grocer's reacher" is also a handy item.

I did toy with the idea—and you might, too, if your space is a little differently proportioned—of having the main line oval, layover track and reverse loop at a high level with a branch leading down to the yards. Although this would improve accessibility, it would also put a bridge across the many switches of the yard throat, a bad feature from a reaching standpoint, but not so bad from a scenic one.



The revised Small Valley and Broad Mountain Lines layout—HO gauge. Below is the original.

PIKE REGISTRY BUREAU

ALLEGHENY MOUNTAIN R.R. CO.—Thomas Zook, Kane, Pa. (O)
 ATLANTIC & PACIFIC RAILROAD—Thomas S. Farley, Eatontown, N. J. (HO)
 THE BALLYMORE ROAD—Robert E. Whitmoyer, Flint, Michigan (HO)
 BALTIMORE & POTOMAC VALLEY R.R.—Charles R. Lloyd, Baltimore, Md. (HO)
 BIBLE HILL WESTERN—Stan Hingley, Truro, N. S., Canada (S)
 BRANTWOOD & WAYSIDE R.R.—Van Bachman, Short Hills, N. J. (O)
 CANADIAN FICTIONAL R.R.—G. Shortliffe, Kingston, Ontario (HO)
 CANADIAN NORTHWESTERN R.R.—Glenn Woodside, Kingston, Ontario (HO)
 CENTRAL JERSEY & ATLANTIC SHORT ROUTE—Bob King, Philadelphia, Pa. (O)
 CENTRAL VERMONT MILL VALLEY R.R.—Kenneth Shuker, Brewster, N. Y. (HO)
 CHAMBLIN EXPRESS LINES—Carlin Morris, Chambersburg, Pa. (O)
 CHICAGO & ALTON—Fremont E. Wilson, USNAS, Lakehurst, N. J. (HO)
 COLESON VALLEY R.R.—T. & A. Cole, Portland, Ore. (O)
 COPPER CREEK RAILROAD—George Makinson, Newark, N. J. (HO)
 DON MILL VALLEY RAILROAD—D. Gross, York, Pa. (HO)
 DOT LINE R.R.—R. Scherr, North Wales, Pa. (HO)
 DUSTY ATTIC LINES—Elwyn Mack, Essex, Conn. (O)
 EASTERN CENTRAL—Dick Tully, Brookline, Mass. (HO)
 EASTERN STATES & ATLANTIC SEABOARD LINES—John Dowlan, Philadelphia, Pa. (S & O)
 EAST ROCKPORT AND LAKE ERIE R.R.—Roger Van Dyke, Lakewood, Ohio (O)
 EAST WEST & CENTRAL—Earl Cilby, Grand Rapids, Mich. (HO)
 FORT DEARBORN RAILROAD—E. B. Tharp, FPO, San Francisco, Cal. (HO)
 GARRET VALLEY R.R.—Howard Horvath, Passaic, N. J. (O-27)
 GRAND ISLAND CENTRAL—R. J. Woods, Grand Island, N. Y. (O)
 GROVER AND NORTH JERSEY ELECTRIC RY CO.—J. P. Hoschek, Trenton, N. J. (HO)
 HILLTOP R.R.—William Diebold, Madison Wis. (O)

HOUSTON, GALVESTON & TEXAS R.R.—H. G. Tebo, Houston, Texas (O)
 KINGSTON & WESTERN—C. A. Alexander, Kingston, Wash. (HO)
 LEWISVILLE AND ABBEYDALE R.R.—Lew & Abbey Goldstein, Brooklyn, New York (O)
 MOHAWK VALLEY LIMITED R.R.—Donald Adams, Utica, N. Y. (HO)
 MT. SHASTA & QUARTZ VALLEY—Don Wardrip & J. L. Lewis, Yreka, Calif. (HO)
 NAUFOLK AND ATLANTIC RAILROAD—Nassau-Suffolk Model R.R. Engineers, Farmingdale, N. Y. (OO)
 NEW ENGLAND LINES—H. J. and J. E. Mercier, Andover, Conn. (HO & S)
 NORTHEAST & WESTERN R.R.—Stuart Malkin, Montclair, N. J. (HO)
 NYS & W. R. SUSQUEHANNA—Laurence Spindler, Passaic, N. J. (HO)
 PAMPAX LINES—Bob Hilburn, Plainview, Texas (HO)
 PIEDMONT RAILROAD COMPANY—Mark Goforth, Gastonia, N. C. (O27)
 PINE CITY NORTHERN—Dave Wenstrom, Lewiston, Idaho (HO)
 PLEASANT VALLEY RAILROAD—Russell Ness, Galion, Ohio (S)
 RAMAPO VALLEY RAILROAD COMPANY—Frank Flynn, Union Beach, N. J. (O)
 RARITAN RIVER RAILROAD—Jack & Flo Frankel, New Brunswick, N. J. (HO)
 REDWOOD VALLEY AND OCEAN ELECTRIC RY.—Robert Townley, San Francisco (O)
 RULEY R.R.—R. L. Vreeland, Sac City, Iowa (HO)
 RUMSON & WINCHESTER RY CO.—Margate, N. J. (HO)
 The SAN ANTONIO & GULF COAST—Ernest Berkemeier, San Antonio, Texas (O & HO)
 SANDY HOOK RAILROAD—David Pool, Ridgefield Park, N. J. (O)
 SANDY VALLEY R.R.—John S. Wolf, Millville, N. J. (HO)
 SIERRA NORTHERN—Richard Kolm, San Francisco, Calif. (HO)
 TT GAUGE GREAT NORTHERN—R. Brakehill, Newark, Ohio (TT)
 WATCHUNG VALLEY R.R.—William C. Johann, Westfield, N. J. (OO)
 WEST CENTRAL LINES—William Freeburger, Mt. Ephraim, N. J. (OO)
 WESTERN VALLEY RAILROAD—Thomas Williams, Ridgewood, N. J. (HO)
 WISCONSIN & ILLINOIS R.R.—Gordon & Charlotte Fenner, Naperville, Ill. (HO)

4-4-4 Live Steam Locomotive

PART II

By H. J. COVENTRY

THE binders (Dr. #244) for this live steam loco should now be made of $\frac{1}{4}$ " square C.R.S., $1\frac{1}{2}$ " long with two #44 holes drilled in at $1\frac{1}{8}$ " centers. These may be used as jigs, when clamped to frames, by spotting through with the #43 drill then drilling down into the frame for about $\frac{1}{4}$ " with a #49 drill which will be tapping size for 2-56 studs or screws. Now the copper rivets may be pushed out (file the head off and knock out with pin punch) and the holes counter-bored as required, taking care to counter-bore on outside faces each frame for a depth of $\frac{3}{32}$ ". Lay the two frames aside for the present.

Now make the front bumper beam of $1" \times \frac{3}{16}"$ C.D.S., mark off and drill the six holes for attachment to the corner angles. Drill the holes #39 at $1\frac{1}{32}"$ spacing as shown and scribe two lines across the inside face of beam exactly $1\frac{1}{8}"$ apart. Set the angles to these lines, clamp, spot drill #39 and redrill #47 and tap 3-48. Put the six screws in, holding the angles to the beam and lay aside. The rear beam may be made up in the same way but this beam has a $\frac{1}{4}" \times \frac{1}{2}"$ slot cut in the center to receive the end of "center sill." The slot is easily made by first drilling two holes $1\frac{1}{4}"$ dia. close together and cleaning out with small square file or narrow pillar file. Lay this aside.

Next cut a piece of $\frac{1}{2}"$ square C.D.S. exactly $9\frac{3}{4}"$ long and drill the three $\frac{3}{16}"$ holes as shown. The draw bar end has to be cut back $1\frac{1}{8}"$ and up $\frac{1}{4}"$ thus forming the tongue. Next make the two filler pieces of $\frac{1}{2}"$ square C.D.S. filed down to $\frac{7}{16}"$ one side. For the rear side frame we will require a "former" cut to the inside contour which may be made of any hard wood about 1" thick. Having made the "former" take the $\frac{3}{4}" \times \frac{1}{8}"$ C.D.S. and bend to 30 degrees, this may be done in a vise and checked to fit the former. Now put a clamp over the former and the steel strip and bend down to the contour—beat down with a lead or soft hammer. Make two pieces and trim the ends to dimensions given. Now drill two #30 holes in rear end and one #30 front end $1\frac{1}{32}"$ up from bottom edge as shown on drawing. This last hole should be slightly countersunk.

Everything should now be ready for assembling, before doing so, however, chuck two pieces of round stock brass or steel, say $\frac{1}{2}"$ dia., face off one end and drill and tap 5-40 in the lathe from the tailstock chuck. Face the pieces off exactly $1\frac{1}{8}"$ long. Place these pieces between the main frames at the middle holes on the $3\frac{5}{8}"$ and $3\frac{7}{8}"$ center lines and screw up. The main frames will now

be nicely parallel and in line with each other. This should be checked by laying the frame down on the surface plate, edges up. Also test the alignment of pedestals by squaring across through the openings, the stock of the square being placed against the frame surface. Any correction required may be made now, then put in the front bumper beam which will be found a nice snug fit over the angles, clamp, spot drill #39 through the three holes, then follow with #47 and tap 3-48 in angles. Put filister head screws in tight. The rear portion of the frame is now assembled as a sub assembly by fitting the sides and rear beam, also the center "sill" together with the filler pieces. It is a good trick to sweat the latter parts, then drill right through for the rivet. The rivet head should be quite flush and the outer surface smooth. It should now be checked for dimension $1\frac{1}{8}"$ over and fit nicely between the main frame. Place the main frame and the rear sub assembly on a level surface, tack solder the joint to hold everything while the four holes are drilled and tapped for 5-40 filister head screws. The frame is now complete. The *stretcher* pieces may be left in until we are ready to put in the other cross members.

The next items will be found on Drawings 235 and 244. Two castings will be required which are the brackets carrying the valve gear. The frame fit faces should be filed up square and parallel $1\frac{1}{8}"$ over to be a snug fit between the frames, then trim the outer ends equal distance from these faces, namely $1\frac{1}{4}"$ making $5\frac{1}{4}"$ overall. Check the radius on top, the casting may or may not be a little full here and if full, file to the dimensions given. One of the castings should have the clearance holes for valve rods which are marked "X" on drawing, drill a $\frac{1}{4}"$ hole and open out with a round file to produce the oval slots. The tapping will be done later with the Valve Gear Frame, so put the two castings aside.

Next make the valve gear frame #2235 which will be of $\frac{3}{4}" \times \frac{3}{16}"$ C.D.S. Trim the ends to exactly $4\frac{7}{8}"$ and mark off the four #30 holes and drill same. Tack solder any $\frac{3}{16}"$ material to the edge, so as to obtain a center from which to scribe the curved slot. Lay the center line out carefully and prick punch the ends at $\frac{5}{8}"$ centers. Now step off a number of spaces along the center line, $\frac{1}{4}"$ pitch, by setting the dividers to $\frac{1}{4}"$ and prick punch the intersections getting the point of the punch exactly on the line. A sharply pointed punch and a watchmaker's eyepiece or *loupe* will help a lot on jobs of this kind. The prick

points should be small, therefore use a very light hammer (two ounce) and strike lightly. If examined the points will be found to be evenly on the line and ready for the next operation which will be to enlarge the marks to decided sinks for subsequent drilling. To do this, the writer uses a center punch made of drill rod which has been turned to a sharp cone of 90 degrees, hardened and tempered to dark straw color. Go over the marking out with such a punch and use heavier blow of hammer. This will leave a perfect conical sink exactly where required. Drill the points with a Slocumb combination center drill, then follow with a $1\frac{1}{4}"$ drill. It is now an easy matter to cut out the slight bridges between the holes with a jeweler's or hair saw and finish the slot by filing down the sides. The concave side may be done with a "crossing" file which has curved faces, one side usually of more curvature than the other. The convex side may be finished with narrow "pillar" files. Six inch files will be about right and thin enough to go through the rough slot. Test the slotting with a piece of $\frac{1}{4}"$ drill rod until it slides from end to end without being sloppy.

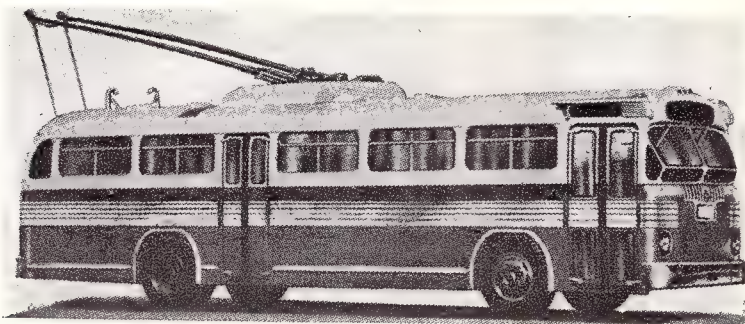
The little bracket #3235 is now made from flat steel or brass and finished to drawing. Clamp or tack solder to the Gear Frame #2235 in position indicated, spot drill #43, drill #47 and tap 2-56. (Soft solder is a useful tool in holding model parts together while being operated upon but always be careful not to allow it to run into any screw threads. To separate the parts, a useful trick is to lay them on a piece of brass made good and hot, this will melt the solder without discoloring the job as might occur if put direct into the gas flame.)

The Lifting Link #4235 may as well be finished to complete all details on this sheet. Cut the link out of $\frac{1}{8}" \times 1"$ flat C.D.S. An easy way to make rounded ends such as this piece calls for is to use two little hard steel bushes and a fitting pin. In this case take a piece of $\frac{1}{4}"$ drill rod, chuck it in lathe, face off end, center drill, and drill #30 from tail stock, cut off $\frac{1}{4}"$ to $\frac{3}{16}"$ long. Make two. Place a $\frac{1}{8}"$ drill rod pin in the hole already drilled in link and put on one of the hardened bushes each side. File the job down to the bushes and a nice square and even job will result. If finished with #4 toolmaker's files (American Swiss), emery cloth will actually spoil the finish if used.

Now the Valve Gear Frame and the Yokes #1235 may be assembled. This may be done as follows: Stand the two

(Text continued on page 46)





CONTROL CIRCUITS

For Model Trolley Bus

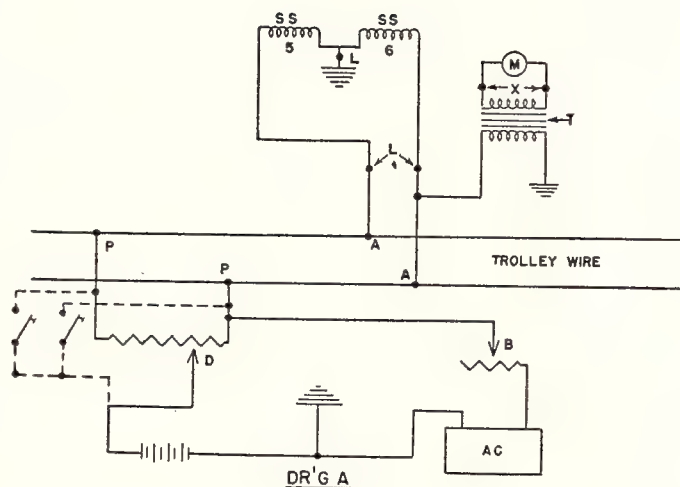
By T. GERALD DYAR

IN THE August 1948 MODEL CRAFTSMAN, the Layout Doctor asks if his ideas for a model trolley bus will work. In a way, this article is an answer to his query.

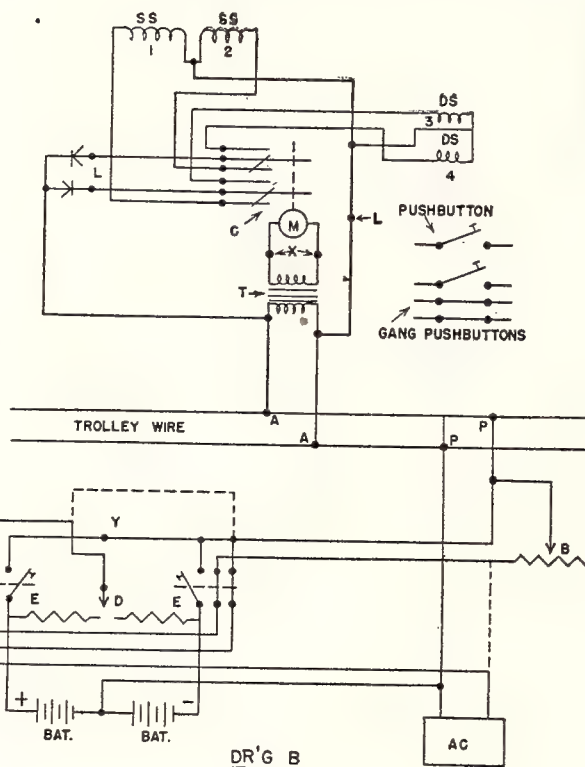
Unless the two wheels opposite the drivers in his bus were pivoted like casters, I should think not, but compare his method with those shown below and decide for yourself.

About four years ago my mind turned in the same direction as the Doctor's and many sleepless nights were spent trying to figure out a way to both steer a bus and run it from two overhead wires and a street ground, let alone with just the overhead wires. Failing in this, the project was set aside until recently when, during the development of a good working remote control coupler and "E" unit, a means was found.

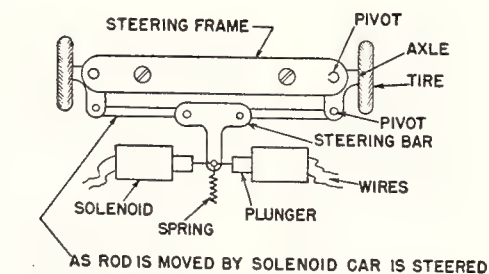
Before going into the circuits shown, there is one which should be mentioned in passing that is very simple electrically but complicated mechanically. In this circuit (not illustrated) a single solenoid is mounted on one side of the steering device (see fig. D) and a spring mounted opposite takes the place of the other solenoid. The single solenoid used is wired from one overhead wire to the ground and the motor from the other



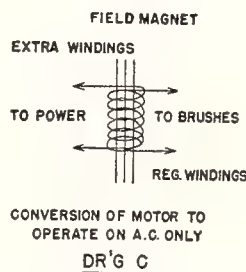
- SS — STEERING SOLENOID
- DS — DOOR OPENING SOLENOID
- C — RELAY CONTACTS USING FIELD MAGNET FOR OPERATION
- A — POINT OF CONTACT OF TROLLEY SHOES
- P — POWER FEEDERS
- B — SPEED CONTROL
- D — STEERING CONTROL
- E — DOOR CONTROL
- T — 1:1 TRANSFORMER



DR'G B



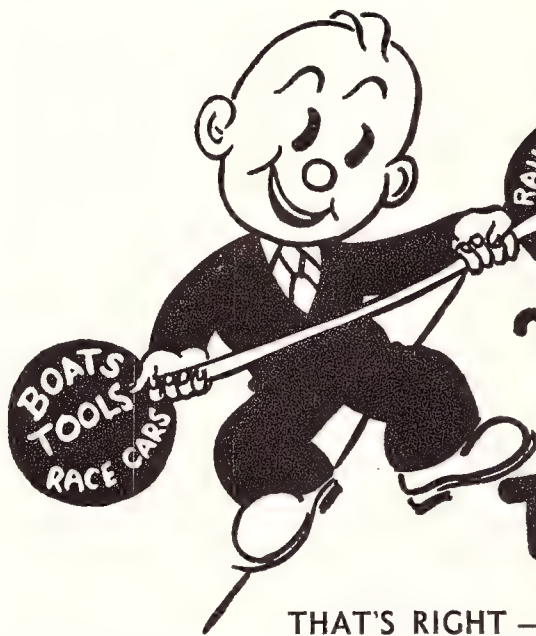
STEERING DEVICE FOR MODEL TROLLEY BUS



DR'G C

overhead wire to the ground. (Note: When ground is referred to here, without explanation, it means a metal street.)

The difficulty with this system, as you may have guessed, is obtaining a solenoid of small size yet strong enough to overcome both the spring and the friction of the steering mechanism. The circuit in drawing A overcomes this difficulty and works like this. The rheostat marked B controls the AC from the source and controls the supply reaching the motor. The transformer (T) pre-



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vents the DC which operates the solenoids from operating the motor. The AC in turn is prevented from operating the solenoids by the windings on them which are of very fine wire and choke out the AC. Varying rheostat B controls how fast your bus will go.

Potentiometer D (a potentiometer is a rheostat which feeds power from, or to, both ends of its resistance) feeds power to the steering solenoids in inversely proportionate quantities (in plain English, as the current in one increases, the current in the other decreases). This steers the bus through the mechanism in drawing D. The dotted lines will be explained below.

Just about now I can see you super-detail hounds making all kinds of faces over the idea of a metal street in your fair cities. You might make the streets out of stainless steel and claim that because of the taxes the railroads pay, the town had paved the streets with silver. You might use chemicals to darken the surface to make it more realistic or you might use the circuit in drawing B.

This circuit needs only the two trolley wires for operation. Following the AC from its source, it goes through contacts in E and E', through a rheostat to control the speed and then through a transformer to run the motor and then to the other trolley wire back to its source. DC will not operate the motor nor AC the solenoids for the same reason as in circuit A.

The steering mechanism is more complex this time. The power source is two batteries arranged as for a two battery power system. The center tap goes to the ground trolley wire. Suppose we want solenoid No. 1 to operate, steering the bus to the right. The current comes from the plus battery and through the left hand resistance.

Let's stop a minute to examine this. The gap shown in front of the movable contact is intentional and is placed there so as not to drain the battery. This gap is wider than the wiper contact so as not to short the batteries when going from one resistance to the other. Following the current from D, it goes through the contacts on E and E' and then to the rectifiers. Being a plus charge, it goes through the lower one to coil No. 1, turning the wheels accordingly. The power returns by the same trolley wire as the AC.

But you say, only one solenoid works at a time in this circuit. Yes, but this solenoid only has to pull the wheels from straight ahead to the direction desired, not from the opposite direction as in the single solenoid circuit mentioned first. Circuit A and Circuit B use the same steering arrangement as in Drawing D and could both be controlled as in Circuit B. But Circuit A uses a continuous resistance because it is a lot easier to use a potentiometer as it comes from the factory than to take out two or three turns of resistance at its center.

About now you're probably wonder-

ing what all the unexplained wiring is in Drawing B. To begin with, all the wiring between the points marked L in both drawings is interchangeable. C indicates a set of relay contacts that operate from the field of the motor. When the motor is going, they are in the position shown—when the motor is off they put the DC through coils 3 and 4. If you can't get enough magnetism to operate the contacts from the field of your motor, put a relay with the contacts, in parallel with the motor at X. What these contacts accomplish is to allow you, when the bus is standing still, to open either the front or rear door of your bus. If you're using Circuit A you will also be able to have both doors open at the same time but not in Circuit B. The door opening solenoids are controlled the same way as the steering solenoids. Use any kind of an arrangement you want to operate the doors. Coils 3 and 4 do not need to have choke windings.

Now how to control this. If you want the wiring inside the bus as shown in drawing B, with the control circuit in drawing A, add the wiring shown in drawing A as dotted lines.

If in drawing B you desire to use the simpler steering circuit of drawing A, use the dotted line wiring in drawing B in place of the wiring through the switches E and E' that it short circuits.

In case you don't find room for the transformer indicated in both drawings,

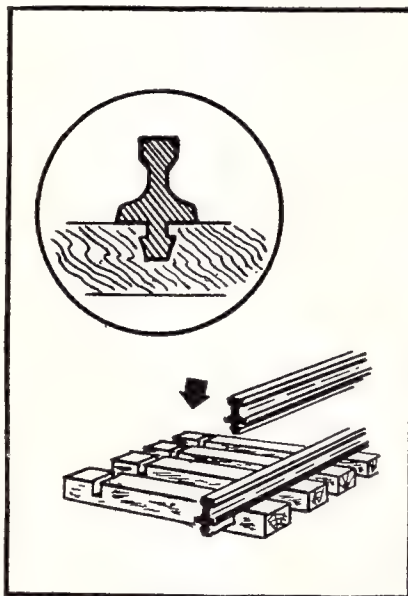
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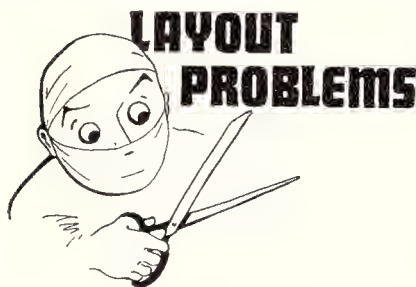
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do as follows: Attach the lead from the field coil that is normally grounded to the frame to the brush that would otherwise receive the incoming current. This will give a closed circuit within the motor. Next ascertain the size of the wire and the number of turns on the field coil. Then using a wire size half that of the field wire, wind twice the number of turns of wire over the field coil making sure that the coils do not short one another out. One lead of this new coil goes to the incoming AC and the other to the return circuit (see drawing C).

A few precautions are necessary with these circuits. Make sure that coils 1, 2, 5 and 6 are wound so as to choke out the AC. Make sure that the transformer is of the right capacity. It should give out the same number of volts and amps it takes in. Its capacity is governed by the requirements of the motor. Last, but most important, unless you're positive that you won't press both E and E' at the same time (drawing B) a fuse or circuit breaker should be inserted at the point marked Y.

No values are given because they vary with the parts used and in a pioneer subject such as this you will probably have some variation of your own that you will want to try.

The thrill that comes from seeing a model trolley bus snake its way through traffic, swing around corners, or pull up to a curb and open its doors to discharge passengers should more than make up for the work that would go into the making of a model of this kind.



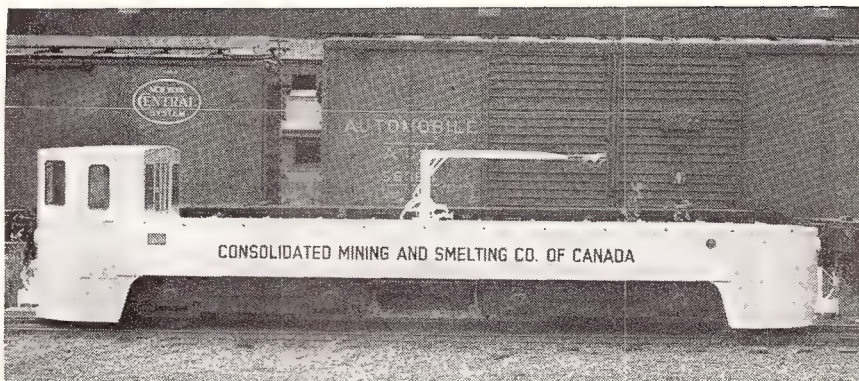
Each month in this space the Layout Doctor will answer questions put to him in his fan mail. The questions will be reworded in the interests of brevity and clarity and attributed to a mythical person from a mythical locality since often essentially the same questions are asked by several persons. Questions not requiring extensive work will also be answered by mail if a stamped and addressed envelope is enclosed.

Dear Sir:

I note that NMRA Standards give 2% as the maximum grade on an HO gauge railroad whereas some of your layouts show grades that rise much steeper than that. Who is kidding who? . . . Archy Underneath, Tallyho, England.

Dear Archy:

This is really the same as the old radius question and the answer is



The largest unit of its kind ever built by the General Electric Company—a forty ton, mine-type electric loco. This loco is of the four axle, high speed, trolley type with an enclosed two-man cab at one end of the platform. The cab is welded to the frame and has windows on all four sides for good visibility. Coupling is the swing draw-bar type, pivoted under the foot plate with the differential car swivel coupler located 11¾" above the rail. Trucks are the two-axle, swivel type with open ends and have welded steel plate bolsters. Four 120 hp traction motors power the loco. The trolley pole is reversible with a wooden pole, heavy duty slider and a maximum length of 8½ ft. The rated draw pull is ten ton with a maximum of twelve. Track gauge is 36", height above rail is 84" and overall length is 29'8".

the same. 2% is a good point of departure but if you can have a grade of under 1% it is much better. However, a given climb takes more running feet the smaller the percentage of grade and model railroaders are usually short on running feet of trackage. On a small layout especially, we often have to climb a lot in a short distance to get a second track level. Accordingly, we get three, four and even five percent grades.

It is evident that the steeper the grades, the shorter your trains must be. Sharp curves on grades imply even shorter trains. A single engine or trolley can climb a very steep grade. I often think of the old Public Service Co. (of N. J.) Hudson River Line which zig-zagged up the face of the Palisades from the Fort Lee Ferry to Palisades Amusement Park and thence on to Paterson. That was a climb which I judge ran to ten or twelve percent, yet a single car negotiated it. Half way up the cliff, the double tracks described a 360 degree loop to continue the climb. (Can anyone furnish a photo of this loop?)

Dar Pill Roller:

Sometimes you assume that a lot of your readers know things that we don't know! You constantly talk of an inside-out figure eight. What is this, fourth dimension or something? . . . E. Q. Steinnagle, Stoopenville, O.

Dear Steinnagle:

The top figure on the right is the conventional figure eight:

Now pal (and you are my pal), flip the top lobe of that eight down over the bottom lobe—turn it inside out—and what do you have, the familiar inside-out figure eight.



FIG. 8



INSIDE-OUT

They're New . . .

TT Gauge Box Cars

The series of freight car kits in TT gauge produced by Jewel Models contain clean-cut wooden floors, ends and roof. The car sides are lettered and fully embossed, complete with rivet and other detail. Ends are dreadnaught. Truck sides and bolster are a brass stamping, axles are of steel, wheels insulated for two-rail insulation—trucks have good rolling qualities. Kit complete in itself, not much work required in assembly—little sanding required on wood parts. The instruction sheet with the kits illustrate in exploded form and perspective how parts go together.

General Lathe Catalog

The complete line of South Bend Lathes are described in a new 64 page general catalog #100-G, obtainable by writing to the South Bend Lathe Works, 411 E. Madison, South Bend 22, Ind. Full color illustrations and lathe specifications are shown in the first 55 pages. Eight pages are devoted to illustrations and descriptions of major lathe attachments and accessories. The catalog also contains drawings showing required floor space for various sizes of lathes.

Matched Power Supply Units

A transformer-rectifier combination has been created which will supply a reliable type of power supply to model pikes—the Thermador Transformer and the Vickers Selenium Rectifier are built in amperage ratings of from 2 to 40 amps DC output and in four combination units to supply most any size layout.

The transformer has been provided with four secondary voltage taps of 17, 18, 19 and 20 volts so that after long service the output can be readjusted to its initial value by raising the alternating current to the rectifier. It is characteristic of selenium type rectifiers to lose a little of their initial output voltage during the first

thousand hours of service and it is for this reason that the extra voltage taps are provided to compensate for this initial loss. The secondary voltage taps eliminate having to use condensers to restore the necessary voltage for proper operation.

The rectifier is designed to supply sufficient voltage to make up for voltage lost in circuit resistance and to provide a full 12 volts for train operation. With the overall voltage regulation under 25% this means there is little voltage variation with changing loads and no faulty operation due to lack of voltage. Literature giving complete information about these two products which are built as individual units is available through Department CR-11, Radio Products Sales, 1501 S. Hill St., Los Angeles 15, Calif.

New Catalog

The Mantua Metal Products Company of Woodbury Heights, N. J., have recently issued the 1949 Edition of their Catalog and Handbook, 50 pages with a card stock cover. The catalog starts off with an introduction to the hobby written by Eric LaNal—a story which should be read by all those just getting their start in model railroading and those vaguely interested. It continues with an excellent coverage of the complete Mantua Line, all HO gauge, fully illustrated, with informative hints for the beginner. Price 50c.

AMERICAN LOCOMOTIVE

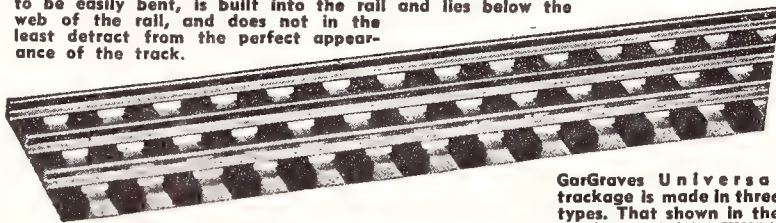
(Continued from page 9)

Now for the fellow who wants to build the cylinder assembly—patience assumed—there are two types of materials suggested for this job. The easier of the two is, of course, hard wood. Wood has the advantage of being easy to work and shape and, too, model cement will hold it securely. However, it has the disadvantage of being very light and the loss of weight will detract from the loco's pulling power. The remaining possible material source is the modeler's customary metal—brass. With this metal, the added weight is desirable, the metal solders well and can be shaped without a lathe or expensive tools. Detail Drawing D will give

GARGRAVES' UNIVERSAL TRACKAGE

For Scale or Tinplate (the PERFECT Hi-Rail or Hi-Iron)

This is GarGraves' patented, flexible, Universal track. As the illustration shows, the steel rails (3/16" high) and wooden ties are built to the exactly correct size and shape for O gauge scale. The patented feature of construction, which eliminates spike heads (thereby permitting tinplate flanges to run perfectly on scale rail), and which permits curves of any radius to be easily bent, is built into the rail and lies below the web of the rail, and does not in the least detract from the perfect appearance of the track.



GarGraves Universal trackage is made in three types. That shown in the cut is the INSIDE THIRD

RAIL TYPE. It mates perfectly with any Lionel trackage except OO, American Flyer trackage except HO and 7/8" and any Marx O gauge trackage. GarGraves is also available in TWO RAIL and in TWO RAIL with every fifth tie longer so the user can install his own Outside Third Rail.

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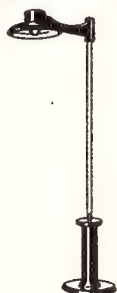
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Pere Marquette 0-8-0. Full size HO drawings, Mar. & May 44 — complete \$.35

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999 N. Y. C. loco, HO detailed drawings, bldg. method (Austin) Sept. Oct. 44 — complete \$.35

Boston & Maine Mogul — Detailed drawings, bldg. method (Austin) Mar thru June 47 — complete \$.75

Live Steam Union Pacific Articulated in 3/4" scale — complete, eleven issues, \$3.50

The issues published during 1947 were memorable ones. They were full of constructive material covering all gauges and all phases of the model railroading hobby. It's impossible to give a complete index in so limited a space, but all the familiar writers were there. To name a few, Austin, Crater, Schopp, Long Valley Electric Ry, Barkley, Hertz and Bartholomew.

Many intricate phases of model railroading were described in detail. Besides the regular departments, there's an interesting lathe series, the workings of electricity as applied to model railroading, prototype plans of locomotives and cars and many construction articles on locomotives, freight and passenger cars, right-of-way equipment, trolleys and layouts.

The complete year of 1947, twelve big issues all in good condition, sold for \$3.70. The special clearance sale price is \$2.50.

Model Craftsman

Dept. B249

Ramsey, N. J.

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Gentlemen:

Please ship me the following numbers of MODEL CRAFTSMAN immediately.

I enclose my check money order in payment. (Add 5¢ to checks.)

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Street

City Zone State

the necessary dimensions. The cylinders, $\frac{3}{8}$ " diameter, can be made from that size dowel if wood is desired, or of brass for the metal assembly.

The steam chest, directly above the cylinders can be fashioned from hard wood or metal. The fancy cap on the top of the chest may be made from almost any material available—wood, metal or cardboard. The saddle portion of the Cylinder Assembly is curved to receive the boiler with a $\frac{1}{16}$ " radius since the boiler proper has a diameter of $\frac{7}{8}$ ". The crosshead guides can be made from $\frac{1}{16}$ " square radio bus wire or the usual third rail wire in model building. I would suggest filing them down just slightly on two of the four surfaces to make them slightly smaller. The cylinders are drilled to receive the guides to a depth of about $\frac{1}{4}$ " and soldered or cemented in place. Naturally, the guides are to be parallel. If the cylinder assembly is made of metal, remember that you can successfully solder only if the metal is clean and "tight fitted." Plenty of heat is also an essential from a heavy soldering iron or small torch.

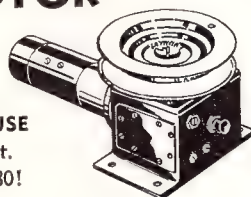
The Crosshead, Detail E, is made from a piece of $\frac{3}{8}$ " x $\frac{3}{8}$ " x $\frac{1}{8}$ " brass or strap iron. Although rather small, it is easily shaped with small files and the jeweler's saw. The crosshead is drilled in the center to pass an 0-80 machine screw.

Although we have not yet mounted the motor nor assembled the various parts so far completed, we have finished the chassis and locomotive mechanism. Next month we will take up the construction of the super structure and complete the model.

Chicago Hobby Exposition

ANOTHER World Hobby Exposition will be held in Chicago, this year from February 19th to 27th. Of all the diversified hobbies on parade, model railroading will be featured. This year manufacturers from all over the country will display their equipment, they'll be there in person to explain the functions of their products, the whys and hows. The

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Atlantic & Pacific Operating Manual, gives complete history and full instructions for building & operating these Mantua Locos. Price, \$1.00

1949 MANTUA CATALOGUE & HANDBOOK shows complete Mantua Line and contains a wealth of model railroading lore. Price: 50 cents

All Mantua Equipment and parts available from dealers coast-to-coast

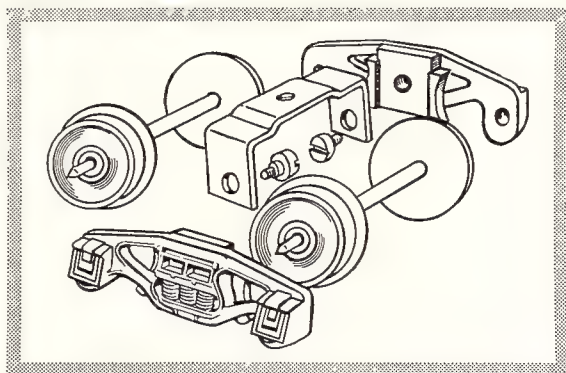


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**Where can you get so much
truck for so little dough?
Look what your buck brings in a Varney
HO truck kit:**

- Controlled equalization
Built-in equalizing medium really works. New undercut bolster screw, side frame shoulders and exceptionally close tolerances (1/1000-inch) make a free moving, equalizing "walking-beam" action that is a joy to behold.
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Definite fit, not elongated. Minimum friction. Give much greater rolling power. Less power to start ... coast longer to easy stop.
- Solid turned brass wheels
- Insulation sure and solid
- Steel axles, turned ends
- Heavy side frames
- Sharp clear detail
- Brake shoes (dummy)
- Brass bolsters, NMRA height
- New 1949 performance!
- Cinch to assemble:
Start new bolster screws with match or small screw driver. Slip in wheels. Take up screws. That's all. Then spring bolster with thumbs and forefingers just enough to let wheels spin, and you have the smoothest-running equalizing action in any HO trucks.

Try a pair on any car of any make you have. See if you don't agree with us — that the 1949 Varney trucks are the best running trucks in HO gauge!

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Varney leads — HO leads

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 HO Switches Top Stopped, ready to lay —
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*USE YOUR FAVORITE MODEL MAGAZINE
to shop at Dildine's*

Baltimore and Ohio's new portable HO layout will be on display for the first time besides many other operating layouts in all gauges. A new feature for the Chicago show will be a Railroad Workshop, so popular at the Philadelphia exhibit. Here model builders will assemble commercial kits, donated by various manufacturers, ranging from locos to right-of-way structures. You will see these models in all phases of construction and as they are completed, they will be put on display. At the close of the show these models will be judged, prizes awarded to winners and all equipment will be returned to the individual builders. Whether beginner or vet, this show will be of interest to all model rails. Doors are open from 1 'til 11 P.M.

You Asked for It!

WHILE doing the articles on the Streamliner "Mixed Breed" it occurred that the Diesel with which the series started would not be a satisfactory locomotive. Yeah! I am an old steam man! I have accepted and appreciated the all weather comfort of the Diesel Cab in my regular work, however, you can feel the steam doing its stuff where with the Diesel it is necessary to rely on the speedometer, ammeter and other indicators, also a whole set of new judgments must be mastered.

Consequently a request was published for readers to suggest a streamlined steam locomotive to be modeled by me and described in subsequent issues of the Craftsman. Your response has been most gratifying—and best of all, the locomotive requested by the great majority of letters is one which really has something under the shrouding—the Norfolk & Western's Class J 4-8-4. This loco includes all the developments which mechanical engineering have contributed to the modern coal-burning steam locomotive.

The N & W Motive Power Department provided the necessary drawings and their further courtesies and assistance has been

LIVE STEAM MODELS

Designed and Built to Order Only.
 Simplest four-wheel models to most exacting workable copy of an original.
GENERAL MODEL MACHINE WORK DONE.
YOUR CASTINGS MACHINED, partly or complete. SPECIAL PARTS made.

R. KNIGHT

Ramsey

New Jersey

more than adequate to make this model possible. With their permission, I was able to spend part of my vacation on the N. & W. observing these and other truly modern locomotives in their shops, at the round house and on the road. I can verify the performance claims made for them and predict that steam is by no means on its way out. True enough the Diesel is here and there is a place for it. Only experience will define its place in the future as it will define the place for the steam and electric power. These will adjust themselves to the economic requirements, according to their inherent advantages, as these factors become apparent. Our feelings and preferences will also adjust themselves accordingly.

So, starting with the March issue, we will describe the construction of this powerful steam locomotive in step-by-step fashion. . . . *Warren B. Crater.*

AROUND THE CLUBS

(Continued from page 3)

its full-sized predecessor, the HO Pan-Am Railroad was born. Those responsible for this great event call themselves the Canal Zone Society of Model RR Engineers, now comprising 20 active members.

Their first problem—as usual—was a site for a layout. After much wracking of brains, the Corozal R.R. Station was decided on and then after much wringing of hands, a lease was obtained from the Panama Canal and the Panama R.R. One of the first pieces of business to be acted upon was to make the club 100% N.M.R.A.

Construction began in June and to date approximately 500 feet of track and 32 switches have been laid. Parts of the system will be modeled after the Panama Railroad. Operation will be controlled from five panels, rolling stock is individually owned.

If ever you happen to be down that way, you can meet 'em any Tuesday or Thursday at the Crossroads of the World!

PITTSBURGH, PA. The Mid-Central Regional meeting of the NMRA will be held in Pittsburgh March 19 and 20. A trip through a steel mill is planned for Saturday afternoon, all transportation

will be arranged. This will be followed by a gab session and operation at the Pittsburgh HO Railroad Club, 1013 Penn Ave. A group breakfast is on the agenda for Sunday with the business meeting following. Door prizes, gifts and also a streamline locomotive for every one attending will be distributed. There will be plenty of time for more operation, sight-seeing and photographing. Reasonable hotel accommodations are conveniently located across from the club.

LOS ANGELES, CALIF. Attention, *Slim Gaugers!* An HO Narrow Gauge Guild has been organized, composed of members of the Pacific Coast Region of the NMRA. It is now in the process of setting up HON3 standards to be submitted to the NMRA standards committee. At a recent PCR meeting, several manufacturers met with the group and expressed their desire to make parts, providing there was enough nation-wide interest in this unique gauge. At present, Dale Newton and Central Valley Model Works are putting the finishing touches on HON3 passenger and freight trucks. Ray Haas (Long Beach) will shortly announce a 90 pound rail while Bert Hannigan (Van Nuys) will produce a locomotive frame.

Any railroader interested in HO Narrow Gauge should contact the Guild through G. Grabert, 113A W. 21st, Long Beach, or S. Sanders, 617 Adelyn Drive, San Gabriel, Calif. They will have all information on hand regarding parts, also data on NG equipment.

EAST ORANGE, N. J. On Feb. 14, the West Essex Model RR Club will hold an open house to celebrate their second year at their present location, the Brownstone Church, at Main and Halstead Sts. There will be movies followed by operation on the club's HO gauge, "Essex Connecting."

The club expects to add another control panel, making a total of five—this will allow the operation of ten trains at once. Work is under way on the main freight yard and the surveyors are looking toward the upper level and construction is expected to start there soon. The Mountain Division has been scened since the Mid-Eastern Regional NMRA Convention in April.

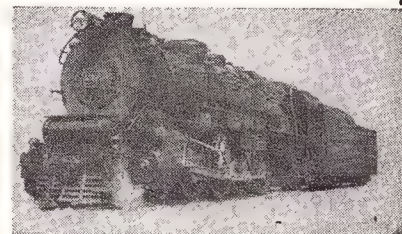
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Roundhouse 0-6-0 Switcher	37.50
Mantua Atlantic	45.00
Consolidated	45.00
Varney Pacific	55.00
Dallas A & B 8-wheel passenger Diesel, both	60.00
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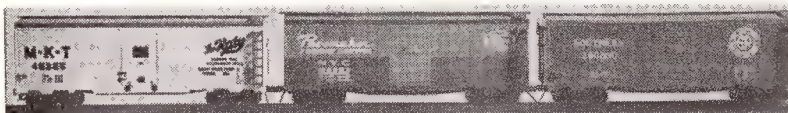
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the Highland & Oceanic Railroad Club was first organized in Feb. of 1947 with ten charter members. As is usually the case, many changes have been made from the original layout on paper. They started in with the framework, then the roadbed and finally with one "make" of track which was torn out and replaced with another "make." The actual space for the layout is 12 1/2 x 25 feet and when all the track is laid, including freight and passenger yards, there will be a minimum of 225 feet. As yet very little has been done in the landscaping department.

As there is an active "O" gauge club in the city, The Charlotte Model RR Club, they wanted to be definitely identified as an HO outfit—their titled had to include the initials H and O. They finally arrived at "The Highland and Oceanic—serving Carolina (North) from the Mountains to the Coast." Meetings, for business (very short session) and work, are held every Monday at their layout, 326 1/2 S. Church St. Visiting rails are always welcome.

TORONTO, CANADA. Members of the Model RR Club of Toronto are speeding completion of their club pike, the Canadian Great Western Railway, so that it will be ready for the Niagara Frontier Regional Meeting to be held in Toronto May 21 and 22. One of the largest model railroads on the continent, it is situated in two 140 x 20 ft. adjoining rooms connected at one end, thus forming a large U. The layout in one room is largely urban in character and in it are located the passenger and freight yards, engine terminal facilities and main passenger station. The pike contains such features as a 120 ft. double track straightaway, a 15 stall roundhouse, a trolley line and numerous others. It is completely scenerized in great detail and is operated by tower control with route interlocking applied to the main terminal.

IRVINGTON, N. J. The North Jersey Midland OO Model RR Assoc. has just inaugurated a new plan so that "stockholders" who wish to purchase new and sometimes expensive equipment for his pike and due to financial obligations finds that he cannot do so, may make the purchases through the plan. For example, a fan trip may come up and a member finds that he can't finance it and yet wants to go on the trip, the NJM comes to the rescue. This member makes a request to the Treasurer, Wally Isley, the Morgenthau of the organization, stating his problem. The treasurer checks up on the member's dues and if he is up to date, he will be allowed to purchase a fan trip ticket with club money. The member will then return the borrowed money on a weekly basis at a rate he can afford. This borrowed money is limited to 50% of paid in dues (\$2.00 monthly).

This plan not only helps members of the organization but it helps the model railroad industry as well. The members feel it is very practical and would like to encourage other clubs to try it. Anyone wishing information on the plan or about the club can contact Newton Guerin,

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3/4" scale, classes 4-8-4 & 4-8-4.....	\$3.00
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212 Maple Ave. The club welcomes any new members!

BINGHAMTON, N. Y. The Binghamton Model Railroad Club, which meets Thursday evenings at 13 Westwood Court, reports steady, though not spectacular, progress in its task of completing an operating layout. They have no plans for expansion nor fan trips on the fire, but are plugging away at the little things that go to finish a model pike. The layout is O gauge, 3-rail, AC powered. It consists of double-track main lines on two levels, connecting grades and a small yard on the lower level. There is also a 6-stall roundhouse and, believe it or not, all this in a space 14' x 22'. The main line curves are 5' radius although there are plenty of 4' curves in the yards. Scenery for the pike is well along, a recently added hand-painted background contributes very greatly to the overall effect. The groundwork is completed and is being covered with flocking, this job has passed the 3/4 mark. Ten switch machines are installed and the trackwork is complete with the exception of hooking up switch points. The next projects on the list are an electrically operated turntable and a set-up for control boards, engineer control being favored. Masonite is on hand for the panels and they expect to have something in this line quite shortly.

HOBOKEN, N. J. The nineteenth Annual Show & Exhibition of the New York Society of Model Engineers will be held from February 11 through 22 inclusive. Open daily from 5:30 to 10 P.M. and on Saturdays, Sundays and holidays from 1 to 10 P.M. The show will be held in the upper Ferry Concourse of the Lackawanna Terminal at Hoboken, N. J. This site is easily accessible to all parts of the Metropolitan New York area by train, tube, ferry and bus.

As usual, the exhibition is devoted to both amateur and professional models of various types, including model railroads. Two complete scale model railroads will be in operation, one in O gauge and a portable HO layout.

HIGH BRIDGE BRANCH

(Continued from page 21)

Bridge which was built in 1890 and since strengthened. With sharp curves at both ends imposed by the physical character of the gorge, the expense of a new bridge could not be justified.

Since the branch was built in that era when the ten-wheeler (4-6-0) had largely replaced the American eight-wheeler (4-4-0) as a prime mover, they were the common power for freight service and the predecessor for the passenger service which was for its entire duration "Jerk-Water" by nature and surroundings. Passenger trains were still handled by 4-4-0's until finally abandoned in the early 1930's. All of this information which pre-dates my own observations and experience is based on clippings in two large scrap books which were passed on to me in the early 1920's, in an unfinished state, by my maternal grandfather. He, Wm. H. Rainear, was one of the Camden & Amboy shop men at Bordentown, N. J.,

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N.Y.C. Hudson locomotive and tender #322	28.00
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#632 Hopper car	3.00
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#3B 100 Watt Transformer	10.50
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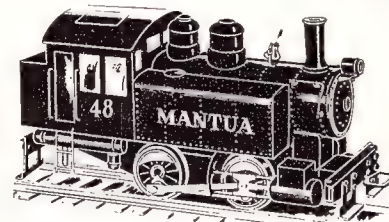
HO GAUGE

AMERICAN FLYER HO . . .

#140 3-car Freight train set with smoke & choo-choo	41.50
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#151 N.Y.C. 4-6-4 Locomotive and tender D.C. Choo & Smoke	25.00

MANTUA . . .

Atlantic locomotive kit	47.50
Pacific locomotive kit	49.50
Hopper, Box or Gondola Kit	ea. 2.95



Mantua Little Busy "B" Switcher engine	\$19.95
Mantua Mogul locomotive kit	29.50
Mantua Roundhouse Goat	24.50
Mantua Belle of the Eighties	29.50

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Winton C&O Articulated 2-6-6-6	59.50
Pennsylvania T-1 4-4-4-4 and tender, complete kit	49.50
Same with 2 motors	59.50
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Lindsay 4-wheel power truck	14.50
Lindsay 6-wheel dummy power truck	3.50
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Great Northern Orange Box car kit	2.95
Globe Cattle Car Kit	2.95
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Ulrich Composite Gondola	2.75
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Clearance of all Varney Box car kits—3 for \$3.95 (except cattle and caboose) Varney Streamline cars, to clear, regularly \$3.50, reduced to \$3.00 each, 3 for \$8.50

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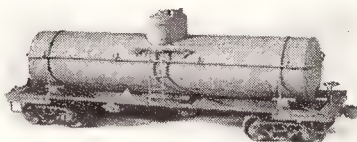
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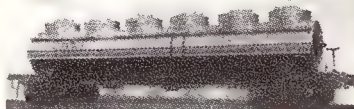


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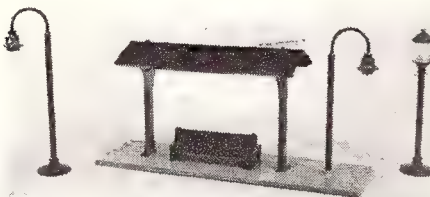
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Tinplate street lights, green finish, all-metal:
7" arch neck type\$1.39
5" and 3/4" boulevard type 85



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BIG VALUE to introduce Selley parts, value over 50c. A real Buy. 12 pieces accurately scaled for HO, finely detailed metal pressure die-castings, ready to put the finishing touches to your pike.

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HO Gauge: Mill Valley kit \$1.35 (mill, warehouse, depot and 3 old-style houses). For 25c each: Houses: Tropical Modern & Modern Ranch, Modern Brick Station & Hotel. For 50c: Sky-scraper (Includes Modern Store). Add 15c postage on orders under 80c. Free circulars.

CAPELLA MODELS, Dept. MC,
601 S. Vermont Ave., Los Angeles 5, Calif.

who restored the locomotive, "John Bull," to its original shape and thus preserved this historic locomotive as a monument to early New Jersey railroading. That is a story in itself and away from the point.

The first 2-8-0's were built for the C. N. J. in 1880 and no item in the clippings shows them on the branch before the 90's. Since they were basically a drag engine, they were quite likely kept to the main line coal drags for that period. Engines of this wheel arrangement were built progressively larger until the 675-684 class of 1906. For all practical purposes, the 4-8-0's Nos. 430 to 480 should be included here. Built 1899 to 1901, they worked with, replaced and were succeeded by the Consolidations during the advancement in design. The 4-8-0's were the largest engines on the branch as late as 1930, when a bridge strengthening program progressively permitted larger engines, until all restrictions were eliminated in 1933 except the above mentioned 15 mph speed on the Gorge Bridge for only the largest engines. During this period the heavier 2-8-0's replaced the 4-8-0's on the Ore Train only to be pulled off in favor of the Mikados. These, in turn, have now given way to the 4500 HP Diesel.

The Milk Trains were handled by the little 4-6-0's which were replaced by the Camel Backs of the same wheel arrangement, numbers 400-423 at about the turn of the century. These, in turn, remained on the branch milk until well up in the twenties when the 4-8-0's took over. These 4-6-0's, being the heaviest road engines that could run over the river bridge at Rockaway, were also used on the passenger trains running between Rockaway and Lake Hopatcong. During time between schedules at Rockaway they did the road drill work to Hibernia. This included some industrial tracks just over the river bridge in addition to the Iron Mines at Beach Glen and Hibernia. For this reason, three of them remained for this work several years after passenger service was discontinued.

The 2-6-0 Moguls 371-376 are said to have been built expressly for the Lake Hopatcong ice trade, in 1907-8. These were superseded by ten-wheelers of the 150-184 class. When the natural ice trade fell off, that which did hold moved in the regular freight trains.

The road drills which have largely replaced the old way freight at places where there is a great amount of industrial work, have centered from High Bridge and Hopatcong Junction for many years. The High Bridge Drill has always done the Chester Work, even to the single coach that used to connect with the branch passenger at German Valley (later as now Long Valley). This was quite logically handled by a little straight 4-6-0. I remember the little Camel Back 2-8-0's numbered 320-330 as far back as 1917 which gave way in the 20's to the 4-8-0. Now with the last 4-8-0 gone, the 150 class ten-wheelers do this work.

When, in the 1920's, the 4-8-0's were the largest on the branch, they handled all the freight, milk and drill work east of Rockaway. This included the ore train,

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the local freight 1933-34, the milk 1931-10 and three road drills. All were housed at the old Hibernia Junction Round House in Rockaway.

The 400 Class 4-6-0's were retired in the late thirties and replaced by small 0-6-0's of which the 93 is the last and will likely be gone when this article is read. The Rockaway River Bridge has now been strengthened to permit passage of larger 0-6-0's. The 4-8-0's are succeeded alternately by the largest 2-8-0's and 4-6-0's. One of each is currently used, being stored at Hopatcong Junction, working two tricks daily except Sundays. The larger engine does the heavy work at the iron mines of the Mt. Hope road and at Hopatcong Jct., also the Arsenals on the W & N. The smaller works to Rockaway and the lighter work in the Ho-Lake Jct. territory.

Last, but not least, is the tremendous summer excursion business, from the towns and cities to Lake Hopatcong. This business was shared with the Lackawanna and there was plenty to keep both roads busy each Sunday and Holiday during the summers. The clippings do not mention this service prior to the early 1900's. Apparently there had been little change in their operation or make-up before my earliest recollection of about 1917. The 600-630 class, of which only five remain, with ten or twelve open platform, wooden coaches and white flags were very much in evidence. Then, in the twenties, the entire consist gave way to the 150-184 class 4-6-0 and wooden vestibule coaches. Hard coal was used and advertised in the late twenties in an attempt to regain this dwindling business. Then with the rebuilding and strengthening of the bridges in the early thirties, the largest 4-6-0's 750-789 came up the branch with steel coaches. Shortly they gave way to the present Pacifics which now have no Lake Excursions to haul since the Ogden Mine Branch has been taken up beyond Morris County Junction.

The fan trains generally are handled by a Pacific and run over the Wharton & Northern to be turned at Green Pond Junction and return.

Today, all service on the Branch is handled in the usual run of interchange cars. It would not be a risk to guess that cars of every operating road and private owner turn up there from time to time.

Equipment Used

There is little to be said on this subject beyond what has been mentioned in the motive power section. Pictures have a way of turning up from time to time together with information supplied by the old rails, natives and others, which is frequently authentic and sometimes verified by records or evidence of some sort.

An "Ore Jimmey," somewhat smaller than the usual "Coal Jimmey," has recently come to light. This is quite likely smaller but of the same capacity as its slightly larger cousin of the black diamond trade because of the greater weight for a given volume of ore.

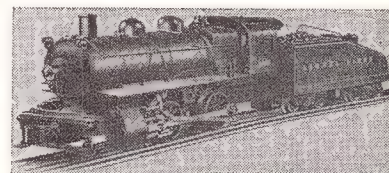
These are probably the only special ore cars ever used on the branch as iron

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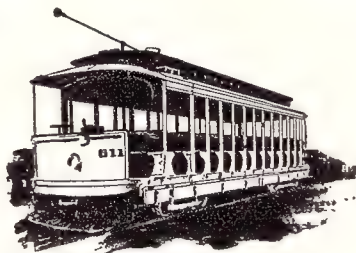
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ore has always been handled in open tops. The C. N. J. has covered hoppers used for zinc ore, cement and a special fine sand. The cement cars frequent the branch, coming from eastern Pennsylvania. The ore is generally handled in the usual coal hoppers. A small heap over each truck weighs in at capacity. Sand is generally shipped in commercial gondolas loaded about level full.

There were a large number of 36 foot steel underframe reefers for milk and ice service principally on the branch. The milk cars were really reefers with the usual ice bunkers and hatches. The ice cars were identical except they had no bunkers and hatches. All were the usual box car red and bore the fried egg insignia which now adorns the Lehigh and New England equipment. This was due to the tie-up with the Lehigh Coal and Navigation Co. whose canal boats had the same sign.

A few of these old ice cars are still in service. They are used as ice houses at the various yards and can be moved to the source of manufactured ice for loading.

GETTING STARTED

(Continued from page 11)

gotta have it. They must be geared to travel at scale speeds and not at a scale two hundred miles an hour. Freight cars must have automatic couplers. I want a brakeman hanging on the side of a box car being switched and engineers and firemen in the cabs of the locos. Somewhere on the line there must be a trestle, a bridge or two and a hill big enough to justify having a tunnel. Like one grade crossing with gates and a watchman and cars waiting for the train to pass. At least one way station with people waiting to get on and the loading platform with baggage trucks, etc.

I want all these things, but above all, I want good, well-laid roadbed with level, easy riding and straight track and switches that work every time. No derailments. Had this in HO, too, and ran every day for several months at a time without a derailment but it called for a lot of maintenance, careful selection of wheels and perfect track work. As I have the space, a larger gauge should be just that much easier to achieve identical results.

Knowing the exact size and shape of the space available for the layout and the gauge, I can start drawing up layout diagrams at any time. There must be space in the building for a work bench, drill press and a few tools. Have tentatively decided to have an around the wall type layout with working space and a spectator room inside. This will call for a draw-bridge by the door as I don't care much for "duck-unders"! Like to hear from some of you fellows and what you would do with a space of like size, assuming that you would like to have your working tools in the same room with the layout. I'll bet the ideas would be many and varied! I'll keep you advised on my progress—a month by month summary of things accomplished!

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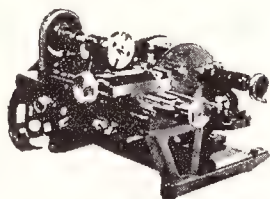
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ALONG THE TINPLATE TRACK

(Continued from page 17)

including locomotives. This book had sold no less than 14,000 copies by 1874, indicative of the truly astounding interest in models during the nineteenth century! The author was, unfortunately, anonymous, and concealed his identity behind the pen name of "A Steady Stoker."

Although this book touches upon the construction of model locomotives, as well as the handling of commercial models, another English volume published about the same time must take top honors for model locomotive constructional material. This is "Toymaking for Amateurs," by the Rev. James Lukin who produced several other books on model-making and amateur engineering.

From a study of many of Lukin's drawings, instructions in machining and lathe work, etc., it is obvious that in his day many people were using the words "Toy" and "Model" interchangeably, another interesting commentary on the early joint development of tinplate and scale.

Rev. Lukin's book includes instructions and drawings for building wooden dummy model locomotives, clockwork locomotives and working steam model locomotives. He does not quite get to an electric model locomotive, although he does include some electrical items in his volume. The illustrations this month are all from Rev. Lukin's volume.

The *Ariel* was Rev. Lukin's simplest locomotive which he described as "the normal type of toy engine." It is extremely interesting to note that this model included a cab, and is actually modeled after a latter prototype than any of Rev. Lukin's more elaborate wooden or live steam locomotives. The more elaborate models, those more nearly approaching the status of scale models are patterned after much earlier British locomotives, a circumstance which has often been noted in connection with English tinplate locomotives, but which is perhaps here most definitely demonstrated. The reasons for this seemingly curious situation may be guessed at, but at present there is not enough evidence to reach a definite conclusion. It is almost as if early English model builders realized they could produce comparatively more detailed and complete models by using older and simpler prototypes. Or it may be partially based on a very deeply ingrained, though perhaps unconscious sentimentality for the pioneer English locomotives. English locomotives did not change as radically and as rapidly in general design as did those on American railroads during the first thirty or forty years of railroading. As a result, a locomotive such as Rev. Lukin's more elaborate wooden model, the *Arrow*, may not have looked too old-fashioned to English modelers in the 1870's.

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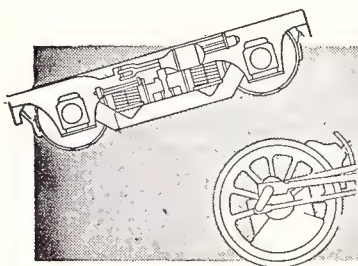
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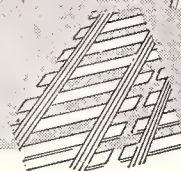
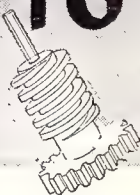
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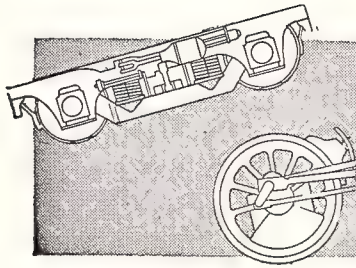
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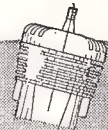
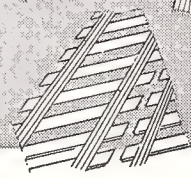
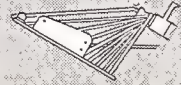
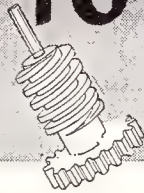
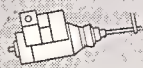
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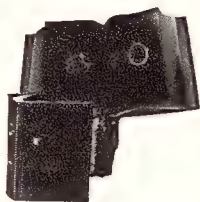
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of wood." Finally, we have his master-
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a "Self-Acting Signal." The signal is
operated by an "indiarubber cord," and
while the blade must, of course, be pulled
down by hand after being tripped, it
was released automatically by the weight
of the locomotive.

4-4-4 LIVE STEAM LOCO

(Text continued from page 25)

yokes up on top edge down on surface
plate and the Gear Frames also edge up
and against the yokes—place a clamp
over the gear frames thus holding all
four parts together. This makes rather
a slender holding so do not attempt to
drill or tap but with a $\frac{1}{8}$ " drill rod
center punch made as described above,
place in one hole each end and tap with
the hammer. Disassemble and prick punch
the mark, center drill, drill #39 and tap
5-40. The unit may now be screwed to-
gether (one screw in each end and the
other four holes finished in regular man-
ner). This whole unit is now ready to
be placed in the Main Frames having
the screws in line with holes at $3\frac{3}{8}$ "
centers. That is the counter bored six
holes which should be used to spot drill
#30 then drill #39 and tapped 5-40.

Bearings and Axles may now be under-
taken (Dr. #244). For the main bear-
ings, a piece of brass rod $\frac{1}{2}$ " x 1" x 5"
long will be required. First scribe the
center line the full length of the bar and
square off the centers for each bore leav-
ing enough between each for cutting off
later. Prick punch the centers then center
drill each. The next operations will de-
pend somewhat upon tool equipment
available. If a good drill press is used,
drill through each, first $\frac{1}{4}$ ", then $\frac{1}{2}$ "
drills—if straight flute drills are used a
good finish will be obtained and ream-
ing will not be necessary. If the builder
does not have straight flute drills, then
be careful to oilstone the cutting lips,
just remove the keen angle of cutting
edge by stroking the oil stone straight
with the drill, this will prevent the drill
grabbing into the work. In the latter
case, use an undersize drill, about $\frac{3}{16}$ "
and finish with reamer.

These operations may also be done in
the lathe, hold the drills in the head-
stock chuck and the work against a pad
in the tailstock. Still another method is
to cut up the bar into the four bearings,
file the top and bottom square, then clamp
on to an angle bracket bolted to lathe
faceplate, the surface of angle bracket
being set to $\frac{1}{2}$ " below lathe centers. Lay
the side of bearing down on the bracket
and line up with tailstock center in line
with the center already spotted. Clamp
up tight and drill from tailstock then

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ream or bore to finish. Do all four bearings same way and they are ready for next operation which will be to produce the side flanges.

Assuming that a milling machine is not available nor a milling attachment for the lathe, make a block per sketch (fig. #1) and bolt on the tool post slide. A hard wood block will do but make the height to suit the lathe so that the bottom edge of an end milling cutter will be $\frac{1}{8}$ " above the surface of the block. Turn up a stud to a sliding fit in the bearing holes and secure it to the block as shown. Square the block across the lathe with a parallel resting on the block and brought up against the face plate on headstock nose. Having everything ready, place one of the bearings on the stud, tighten up with a nut and washer, screw the cross slide forward and back of lathe centers, put the end mill in headstock chuck and feed back. Turn the bearing round and do the same milling. Now check the resulting width which should be $\frac{3}{4}$ " or a nice sliding fit in the frame pedestals. If too wide, it is an easy matter to put back on the fixture, feed up the saddle and take a light cut off each side. Do both sides or the bore will be thrown out of center. Having made one bearing correctly, the lathe saddle may be locked and all the other bearings will be identical, assuming, of course, that the cutter is not moved out of the chuck.

The final operation on the bearings is to push each one tight on a $\frac{1}{2}$ " mandrel and face back $\frac{1}{32}$ " for a circular face as shown on drawing. Drill the oil way on top first #56 then open to form a cup with a #42 drill about $\frac{1}{16}$ " deep. The bearings are now to be put in the frames with the binders in place. Wedge the bearing tight against the binder and spot drill #29, then redrill #39 x $\frac{1}{4}$ " deep and tap 5-40 for spring hanger stud.

The axles and crank pins are a simple lathe job but if the lathe does not have draw-in collets, it would be as well to use material that is over size and turn throughout either between centers for the axles or from chuck for the pins. If collets are available, then $\frac{1}{2}$ " diameter drill rod for axles and $\frac{5}{16}$ " for the pins is the material to use.

In order to avoid any trouble in fitting up later on, it will be necessary to check the work already done so put the bearings in the frames, seeing that the bearing flanges are snug against the side of pedestals, nip them in place with a small clamp across the corner. Measure over the bearing faces, they should be close to $2\frac{1}{4}$ " but not more. If OK, slip the axle through both bearings, if it will not pass through, then look for either out of squareness of the bearing or the pedestal on one side with respect to the other. The axle should, of course, turn over smoothly and if this checks correctly, inspect the shoulders of axle carefully by bringing one end up flush with a bearing face and see if the other side is under the face or protrudes. It should not be under in any case, rather it should stand out very slightly, say from three to five thousandths. A magnifying glass will help in detecting errors.

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Our belief at Scintilla is that you never stand still—unless you're constantly improving you're rapidly losing ground—and so, by the time this catalogue issue begins to show signs of wear and tear everything we make must be closer to perfection. On the test rack, in mock-up stage and on the drawing board are a host of minor and major improvements, plus a goodly number of new products designed to make model railroading even more enjoyable. As they are made ready for general release your dealer will be advised, and so will you be if you are on our mailing list, or read the Model Craftsman and the Model Railroader.

More than a thousand dealers throughout the country carry our power equipment. We sincerely urge that when you are ready to buy a powerpack or power accessories such as rectifiers, or speed controls, the smart thing to do is to go to your nearest model shop and ask to see the Scintilla line. Your dealer will be pleased to suggest the proper unit. Remember, your dealer depends on *YOU*. You can depend on *HIM*. And he knows he can depend on *SCINTILLA*.

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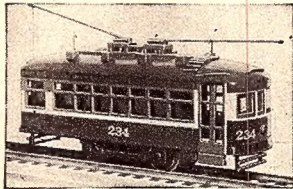
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Birney street car	2.95	17.60

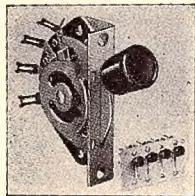
MU CARS

5525 Penn coach	5530 NS coach
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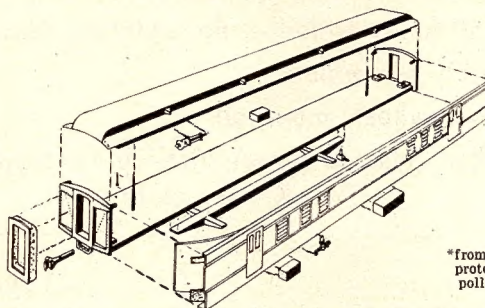
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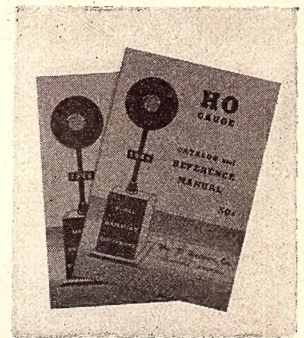
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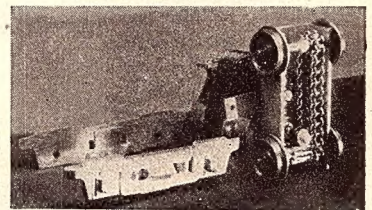
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(Adapt truck to any car body)

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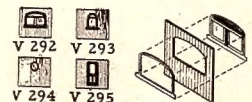
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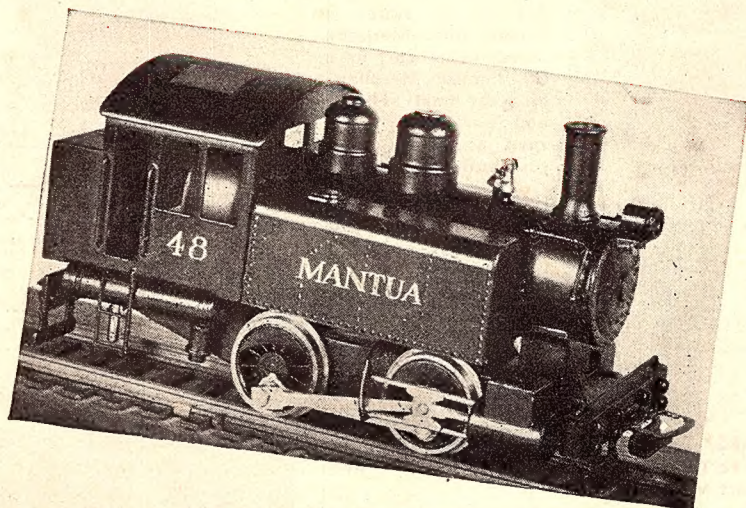
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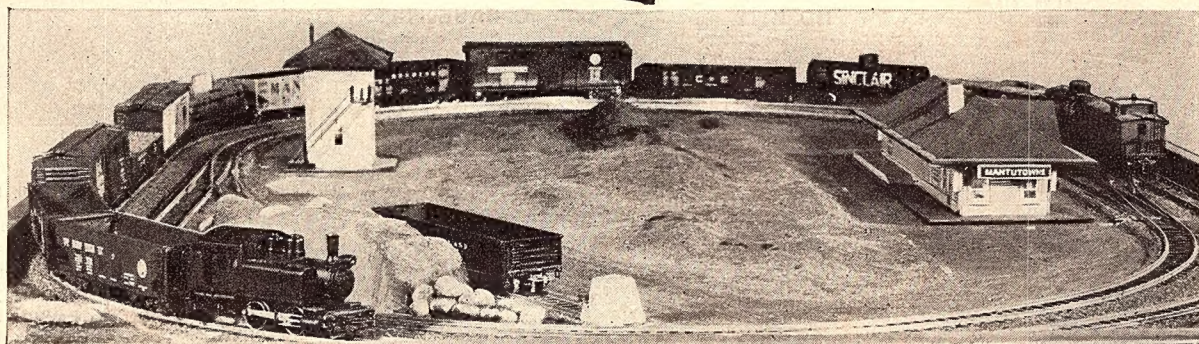
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